THE IRON AGE

THURSDAY, JUNE 18, 1891.

Electric Roads in Pittsburgh.

Some time during the present month another electric street railway line will be put in operation in Pittsburgh. The line is owned by the Birmingham Traction Company, and is about 3½ miles in length, and extends from the Union Depot in Pittsburgh, running along Smithfield street, crossing the Monongahela River by bridge and extends out Carson street on the South Side for a short distance beyond the American Iron and Steel Works of Jones & Laughlins, Limited. Work was commenced on the line about one year ago, and was completed in that time without interfering with traffic on the horse car line, which was kept constantly in operation. The overhead wire system is used. The equipment consists of 30 cars, ten of which are equipped with the Edison and 20 with the Short motors. The power house is equipped with 500 horse-power engines and four dynamos of 200 horse-power each. The entire equipment at the power house is the Edison system, and the generators are the largest now manufactured. The building is 80 feet square, fronting on Carson street, and is said to be perfectly fire proof. Immediately behind it is the boiler room, 50 x 100 feet in size, and containing two batteries of 500 horse-power Babcock and Wilcox boilers. Adjoining the engine room are the machine and repair shops, which are 100 feet square. The car house is 360 feet long by 60 feet wide, and also fronts on Carson street, extending back toward the Monongahela River. Thirty cars have been received from the shops of the Gilbert Mfg. Company of Troy, N. Y., and were mounted in Pittsburgh. The cars are 32 feet long and weigh 10 tons each. With the completion of this line the street railway system of Pittsburgh will compare favorably with that of any other city in the country, and will no doubt excel many systems now in use in larger cities than Pittsburgh.

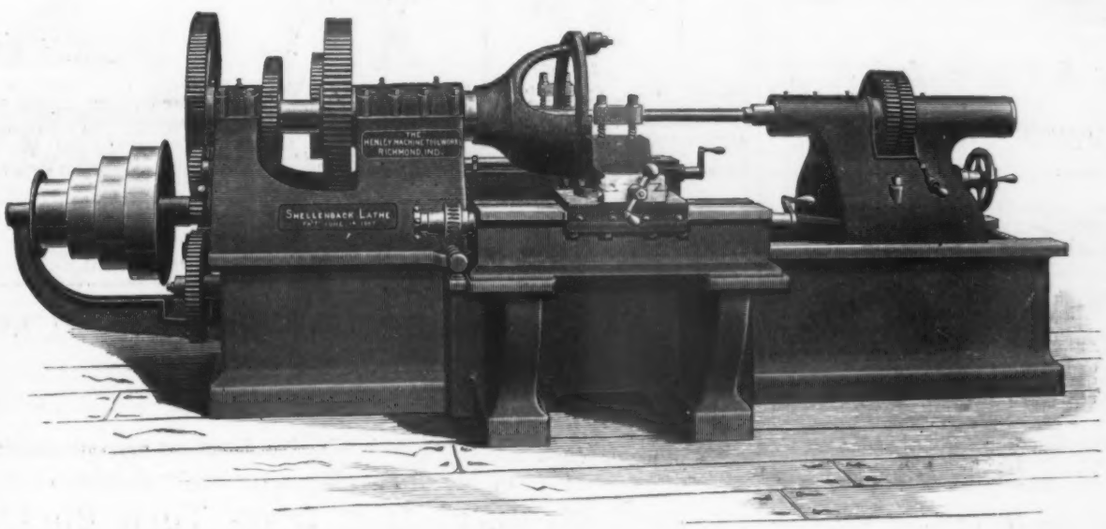
Only a few weeks ago the Duquesne Traction Company put their line in operation, which is about 6 miles in length between terminal points. It extends from the heart of Pittsburgh to Wilkinsburg, a suburb of that city, and is a direct competitor for traffic with the Pittsburgh Traction Company, whose system extends from the foot of Fifth avenue, Pittsburgh, to the suburbs. The competition for traffic between these two lines has been very keen, and has resulted in the Pittsburgh Traction Company reducing their fare from 5 cents to 3 cents. As illustrative of the superior facilities now enjoyed by the citizens of Pittsburgh who do business in the city and live in the suburbs, we can state that only a few years ago people who lived in the East End and traveled by horse-power were compelled to pay 15 cents for riding from Pittsburgh to the East End, and about an hour was consumed in making the journey. The same ground is now covered by the electric lines in less than half that time, and the fare charged by one company is 3 cents, while the other line continues to charge 5 cents.

In about three months from now the Pittsburgh, Allegheny and Manchester Traction Company expect to have their electric line in operation. Their terminal point in Pittsburgh will be at the corner of Fifth avenue and Market street, and their cars will reach Allegheny by way of the suspension bridge over the Allegheny River. They will have three or four different lines, and will cover the greater portion of Allegheny by the different systems. The Thomson-Houston Company of Boston have the contract for the electric equipment, while the cars are now being built by the Pullman Company of Chicago.

Prof. Robert H. Richards, with a party of students from the Boston School of Technology, arrived in Pittsburgh last week. They are visiting that city for the purpose of inspecting some of the iron and steel plants located there. On Thursday, the 11th inst., a dinner was given at the Duquesne Club to Professor Richards and students by the alumni residing in Pittsburgh. C. E. Stafford, class of '73, now of Shoenberger, Speer & Co., presided. Among the students present were: Pittsburgh, Prof. F. W. Very, '73; Elliot Holbrook, '74; Edward Knight, '74; Alfred E. Hunt, '76; Henry D. Hibbard, '77; David W. Bissell, '81; George France, '82, and James O. Handy, '86. Toasts were responded to by Professors Richards, Hofman and Very and Messrs, Holbrook, Hunt, Weston, McKenna and Hibbard.

New Pulley Lathes.

The engraving on this page represents a 42 inch pulley lathe built by the Henley Machine Tool Works of Richmond, Ind. The 60-inch lathe shown by the drawing on the next page is of the same design, but is built much heavier throughout. The bed of the former is 9 feet 4 inches long, 24½ inches wide at each end and 5 feet 3 inches wide at the center. The main spindle is $4\frac{7}{16}$ inches in diameter, 37⅝ inches long and is bored 2 inches in diameter for a depth of 16 inches. One chuck is 22½ inches in diameter for pulleys 42 inches diameter by 30 inches face down to 24 inches in diameter. There is another chuck 11 inches in diameter for smaller pulleys.



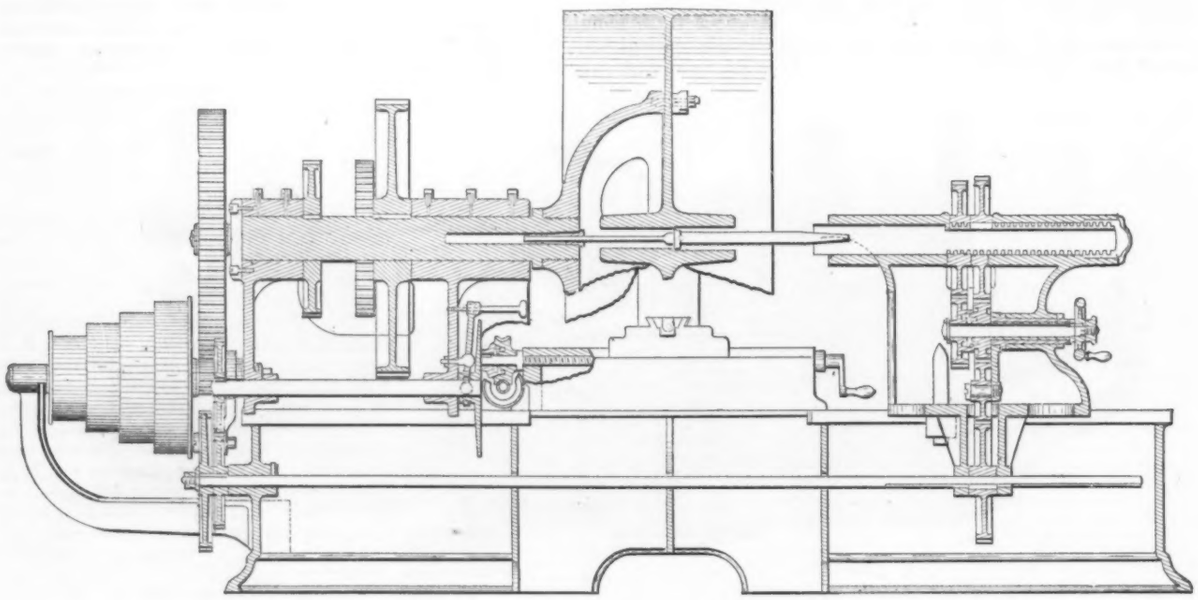
FORTY-TWO INCH PULLEY LATHE, MADE BY THE HENLEY MACHINE TOOL WORKS.

The bed of the larger lathe is 10 feet 4 inches long, 36 inches wide at the head and foot stock ends, 7 feet 2 inches wide where the rails rest, and is graduated to facilitate setting the rails for different sizes of work.

The steel in the main spindle is of the best quality, $5\frac{1}{16}$ inches diameter, 45⅞ inches long, and is bored in the center 2 inches in diameter and 20 inches deep to allow the boring bar to pass in; the outer end of the hole is bored taper, into which is fitted the boring bar gland, as shown in the sectional view. The spindle is provided with a chuck 37½ inches in diameter for pulleys from 60 inches in diameter by 36 inches face down to 40 inches in diameter, and one chuck 22½ inches in diameter for pulleys from 39 inches down to 24 inches in diameter. The front bearing for this spindle is 16 inches long and the base bearing 8 inches long. The footstock has a boring arbor $3\frac{1}{16}$ x 40 inches long, the front end of which is bored taper to receive the boring bar and is provided with a continuous feed, and will bore holes 16 inches deep; there are three changes of speed for boring large or small holes. The boring bar is $1\frac{7}{8}$ x 43 inches and is mortised through and provined with one flat cutter. The footstock has power mechanism for moving it for-

ward or back, being operated by a handle extending through its side.

The power for this, as well as for the boring arbor, is obtained from a shaft inside of the bed which extends the entire length and is driven directly from the cone pinion. The rails are 42 inches long, 12 inches wide, and may be set to turn either straight or crowning faces. The front one is supplied with a compound saddle and tool rest, which may be set to any angle to face off bevel work. The saddle on the back rail is rigid, and each has a bearing surface on the rails of 16 inches long, 12 inches wide. They may be moved in opposite directions separately or together, and are provided with a strong, continuous friction feed, ranging from 0 to ¾ inch to one revolution of the main spindle. All gears and pinions are cut from solid blanks and the two main driving pinions are steel. The lathe is geared 75 to 1 and has ample power for the heaviest work required. The driving cone has four steps, 19 inch, 16 inch, 13 inch and 10 inch, 4½ inch face. The weight of the lathe complete is 13,000 pounds.



VERTICAL LONGITUDINAL SECTION OF 60-INCH PULLEY LATHE, MADE BY HENLEY MACHINE TOOL WORKS.

Progress in Copper Welding.

The New Process Welding and Spinning Company have opened an office in Room 19, Rialto Building, Chicago. Invitations were sent out last week to a number of persons to visit the office on the 13th, to inspect samples of the work recently done by this company in the welding of brass and copper. It was a very remarkable exhibit of the character of the work to be done under the Bevington process, which was described in our columns March 12. The welding of tubes, strips, rods, wire, sheets, &c., was shown in almost every manner required in the manufacture of copper and brass articles. The company have now undertaken to make cartridge cases for the dynamite shells used by the Government. These cases are made of brass tubes of 2½ to 4 inches in diameter, with one end closed by the metal of the tube itself being forced up and welded in place as perfectly as if a cap had been brazed on. These cases have heretofore been cast and reamed out, which was a very expensive operation. The thickness of the material is no bar to the perfect operation of the process. A curious piece of work shown was the perfect welding into a tube of a ribbon of brass or copper wound spirally, and then butt-welded. Heavy and light copper and brass wires were shown welded into bars at one end. A wide field is apparently open for the use of this process in the reduction of tubing from one caliber to a smaller, thus avoiding the use of couplings and cutting threads. It is thus of great value to gas fitters and other workers in brass, such as manufacturers of office fittings, &c. The use of caps screwed on the ends of tubes to make reservoirs, as, for instance, in filtering machines and other devices, is wholly avoided by the use of this welding process.

The company have found by practical work that the process can be used for welding iron or steel. Aluminum has also been welded easily, the only point essential being the use of copper dies instead of steel dies. No heat is required, and the metal treated in this way is not brittle afterward. Frictional heat is merely evolved by the lathe in which the articles to be welded are placed. By controlling the revolutions of the lathe any degree of heat desired can be secured. Nor is it necessary that the lathe should be operated at high speed. Only 800 revolutions are needed for ordinary welding, and but 30 revolutions were required in making the large cartridge cases. A peculiarity of the process is that the metal treated requires no finish afterward, being perfectly polished when taken from the lathe. The company have not yet fully determined upon their plans for the future, but will for a time operate a factory at Aurora and another in Chicago on a limited line of special work.

The Campanhia Nacion de Foejas e Estaleiros of Rio de Janeiro, Brazil, have placed the order for a large iron building to be used in connection with their shipbuilding plant with the Berlin Iron Bridge Company of East Berlin, Conn., and the order for the machinery with J. A. Fay & Co., of Cincinnati, Ohio. The building will be made entirely of iron, 165 feet wide by 300 feet long, and will be shipped by steamer from this country, the parts being carefully marked so that it can be erected in place by native workmen at Rio de Janeiro. The Berlin Iron Bridge Company are doing a large trade with the South American republics, arising from the closer commercial relations.

The Ammen Defense Ram.

When the Ammen defense ram goes out of the Kennebec River, Maine, she will be quite a different craft from what she was on paper; for, since the contract was closed, the Bath Iron Works officials have suggested several changes which might make the unique craft more effective, and they have been adopted by the Department of Naval Construction at Washington. The most important of these is the addition of 800 horse-power to her engines and 8 feet additional length, both elements increasing the vessel's speed, for the additional length has been used to give her a sharper bow and an easier entrance to the water, while the additional horse-power is practically so much clear gain in the ability of the craft to develop speed. Then, when she was ordered, she had no armament deserving the name, and might easily have been destroyed by a torpedo boat, which could approach her with impunity and blow her to pieces, easily avoiding the deadly ram of her large opponent. But now she will carry, in addition to her light arms and quick fire pieces, two 14-inch rifles of the most improved kind, mounted one at either end, and these are calculated to stop any torpedo flyer before it could get anywhere near enough to launch its destructive missiles with effect. Being an exceedingly heavy craft, nine-tenths under water, she will afford her gunners an excellent place from which to do their shooting, and she will now be in no more danger from these little destroyers than is the larger man-of-war with her batteries of guns.

The first general meeting of the stockholders of the Cleveland-Cliffs Iron Company to elect a board of directors, make by-laws, &c., was held in Cleveland on Monday, the 8th inst. The notice calling the meeting bears the signatures of William G. Mather, Jas. H. Hoyt, A. C. Dustin, Fred A. Morse and Henry S. Sherman, corporators.

The Sales of Pittsburgh Concerns.

All business firms in Pittsburgh are required to send a sworn statement of the amount of business done each year to the City Treasurer, in order that they may be assessed a business tax on the same. In many cases firms refuse to furnish the information, and the amount of business done by such concerns is estimated by the assessor. The following are the returns made by some of the prominent manufacturing firms of that city for the year commencing on April 1, 1890, and ending on March 31, 1891:

McConway, Torley & Co.	$1,140,000
S. B. Rheam & Co.	60,000
Seaman, Sleeth & Black	339,000
Shiffler Bridge Company	400,000
A. M. Byers & Co.	1,020,704
U. Baird Machinery Company	145,315
Best, Fox & Co.	250,000
Crescent Steel Company	961,000
Columbia Iron and Steel Company	200,000
A. W. Cadman & Co.	95,874
Duquesne Tube Works Company	200,000
Fayette Mfg. Company	135,000
Harmes Machine Company	100,000
Riter & Conley	1,500,000
W. B. Scaife & Sons	150,000
Singer, Nimick & Co., Limited	1,102,278
Sheriff Machine Company	81,900
The Lodge & Davis Machine Company	100,000
The Carroll-Porter Boiler and Tank Company	100,000
Shook-Anderson Mfg. Company	125,000
American Tube and Iron Company	50,000
A. Bradley & Co.	100,000
Barnes Safe and Lock Company	231,000
Chess, Cook & Co.	77,640
Clinton Iron and Steel Company	100,000
Electric Mining and Machine Company	100,000
A. Garrison Foundry Company	468,970
Jones & Laughlins, Limited	5,000,000
Kay Bros. & Co.	200,000
Laughlin & Co.	291,399
J. A. McCormick	50,000
Lockhart Iron and Steel Company	200,000
Leechburg Foundry and Machine Company	150,000
Marshall Bros., machinists	90,000
Manufacturers' Natural Gas Company	244,155
National Tube Works Company	100,000
Niles Tool Works	90,000
J. & J. B. Milholland	125,000
S. Jarris Adams & Co.	200,000
L. S. McKallip & Co.	200,000
Howe, Brown & Co.	947,000
Standard Underground Cable Company	597,187
Epping, Carpenter & Co.	101,000
Enterprise Drilling Company	130,000
William Fisher	63,500
Fahey & Fowler	100,000
W. J. Hammond	100,000
Hainesworth Steel Company	100,000
Harbison & Walker	400,000
Hussey, Binns & Co., Limited	180,560
Ireland & Hughes	90,000
Jas. Lappan & Co.	75,000
L. M. Morris	325,071
R. Munroe & Co.	125,000
Marshall Foundry and Construction Company	500,000
Jas. McNeil & Bro.	200,000
James McKay & Co., chains	100,000
McGill & Co.	52,000
Park, Bro. & Co., Limited	2,125,045
Pittsburgh Mfg. Company	103,048
Pittsburgh Steel Casting Company	224,754
John Roney	68,085
Scaife Foundry and Machine Company	150,000
Totten & Hogg Iron and Steel Foundry Company	125,000
A. French Spring Company	1,010,000
Westinghouse Machine Company	400,000
Keystone Rolling Mill Company	800,000
Linden Steel Company, Limited	1,000,000
Moorehead-McCleane Company	2,500,000
Pittsburgh Tube Company	1,000,000
John Robson & Co.	64,803
Union Elevator Company	50,000
Carbon Iron Company	150,000
Wm. Clark's Sons & Co.	1,250,000
Iron City Tool Works	250,000
McCullough, Dalzell & Co.	185,000
Pittsburgh Reduction Company, smelting	50,000
Pittsburgh Bridge Company	200,000
Reliance Steel Casting Company	100,000
Sterritt & Thomas	80,150
Springfield Foundry Company	60,000
Koehler & Strong	170,400
Morris, Williams & Bailey	70 700
Velte & McDonald	60,000
Hubbard & Co.	92,123
Keystone Bridge Company	1,355,000
Squires Hardware Company	100,000
Pittsburgh Reduction Company, aluminum	50,000
H. K. Porter & Co.	453,572
People's Natural Gas Company	800,000
Pennsylvania Tube Works	2,150,000
Pittsburgh Steel Works	100,000
Reineke, Wilson & Co.	120,000
Robinson-Rea Mfg. Company	375,000
J. B. Scott & Co.	250,000
Kelly & Jones Mfg. Company	100,000
Wilson Snyder Mfg. Company	200,000
Wilson Safety Brake and Spring Company	100,000
McGinnis & Smith	125,000
A. & T. McKenna	63,944
Wharton McKnight Foundry	127,000
Oil Well Supply Company, Limited	150,000
Wm. G. Price & Co.	150,000
Pittsburgh Supply Company, Limited	500,000
J. Painter's Sons & Co.	686,940
Pennsylvania Construction Company	250,000
Bindley Hardware Company	725,000
Benney Brothers, mill supplies	100,000
Babcock-Wilcox Company	50,000
Bailey, Farrell & Co.	400,000
Carnegie Brothers & Co., Limited	1,000,000
Carnegie, Phipps & Co., Limited	5,000,000
Demmler Bros.	300,000
Dilworth, Porter & Co.	1,000,000
Dexter Spring Company	100,000
Dravo & Black	50,000
Electrical Construction and Mfg. Company	50,000
Graff & Co.	87,000
Gordon Steam Pump Company	50,000
J. H. Harrison & Co.	50,000
Heine Safety Boiler Company	50,000
W. H. Irwin	178,147
Standard Mfg. Company	150,000
Bissell & Co.	167,000
Brown & Co.	764,000
Gally & Finley	100,000
Jarecki Mfg. Company	300,000
W. T. Leggett	93,000
J. C. Lindsay & Co.	275,532
McWhinney & Co.	160,000
Nease, McLean & McGinnis	118,000
Star Encaustic Tile Company	41,200
A. Speer & Son	202,000
Carrie Furnace Company	500,000
Electric Supply and Construction Company	100,000
Westinghouse, C. K., & Co.	100,000
Westinghouse Electric Company	2,000,000
Hammond & Co.	125,000
H. Lloyd, Son & Co.	426,552

Providence Manufactures Abroad.

The news that Russia has secured absolute control for a time of the French Government's arms factory at Chatellerault, France, is interesting to the manufacturers of Providence in two or three ways. In the first place, there is an establishment in that city whose tools and machines are in use in the factory at Chatellerault. The Brown & Sharpe Mfg. Company have been supplying grinding and boring tools for the French arms factories for several years, and since about 1886 have had a continual trade with the French Government.

Lucian Sharpe says that there are four French arms factories of special note. The factory at St. Etienne, near Lyons, employs 14,000 men and turns out about 1000 rifles a day. The Chatellerault factory is smaller, and is situated at the town of that name near the Loire River, or its upper branches. At Tulle, in the Department of Correze, there is a third large rifle works, and at Puteux, near Paris, there is a factory for the manufacture of artillery.

Since about the year 1886 the Leber rifle has been the rifle turned out and used by the French Government. The gun was the successor of the Gras rifle, invented by General Gras, and the Gras rifle in turn succeeded the famous Chassepots, used in the war of 1870. The Leber is a magazine gun firing a cartridge of small diameter. The tendency of all rifle manufacturing, it is said, is in the direction of guns made for smaller bullets than ever before. The Russian Government is to have 3,000,000 rifles made at Chatellerault, and it is supposed that the Leber is the rifle to be turned out.

The manufacture of any rifles is bound to interest Providence people, because they used to manufacture them themselves. The Providence Tool Company were in this business from the early years of the war to about 1880. They began the work for the National Government. The Burnside rifle was then made for a time. Numbers of the old Government muskets were made over and improved. Finally the Martini-Henry rifle was taken up and manufactured. Martini was a Frenchman and Henry an Englishman. After this had been made for some years the Peabody-Martini rifles were invented. They were breech loaders. Their special advantage was in the dropping of the breech block as the gun was fired, so that the fall of the block threw out the empty shells.

These rifles were manufactured for the Turkish Government. First a number were sold to the Roumanian Government. They were so well received, and became so well known that the Turks adopted them a few years later. There was an English firm that was supposed to have a mortgage on the contract, but the tool company beat them. The contract was for 600,000 rifles, and it was with these arms that the Turkish infantry fought the war with Russia. During the fighting around Pleona, the Turks picked off thousands of Russian soldiers at remarkably long distances, it is said. Here was an example of Providence things abroad.

Mr. Peabody of the Peabody-Martini rifle patents is still living. He was department foreman at the Providence Tool Company when he conceived the idea of the patent. The patent was the self-acting breech block, which has been mentioned as the feature of the Peabody-Martini gun. He received a royalty from the tool company, and it is said the Frenchman also had a royalty. Peabody was to get $1 on each gun. Six hundred thousand guns ought to have made him a rich man, and indeed he is well off to-day, but his property does not amount to quite as much as $600,000. Still, he is a rich man, and when he invented the patent he was poor. He is said to be worth over $150,000. His full name is Henry O. Peabody, and his residence is in Boston. His final payments from the tool company were not obtained without difficulty. There was a law suit, but he won it. Then the Turkish Government was slow in its payments to the tool company. The tool company struggled along under this and other loads, and finally went down. The two factories are now used by other concerns. Martini got rich off his royalties and Peabody also was fortunate. They were about the only ones that made any money, in fact, from the making of guns in the city of Providence.

Improvements have been made from time to time in the manufacture of twist drills, and the progress toward perfection has been, perhaps, as marked in this as in any other adjunct of the machine shop. The most notable of these improvements was the adaptation of an entirely new process to their manufacture, which, it is claimed, results in the production of a drill in many ways superior to those made by the old methods. By this process the drills are hot forged and not milled. The "mild center" in bar steel is submitted to the process of forging, whereby the point and cutting lip of the drill is made tougher and firmer than twist drills made by the way in vogue hitherto. In making a drill by this method a piece of steel is taken somewhat shorter than the required length of the completed tool, and this is drawn from the center to a point. The new process is being employed by the New Process Drill Company of Taunton, Mass. The facilities for manufacturing them are soon to be greatly increased. The company employ about 50 skilled mechanics at the works.

Expert Opinion on the Guns of the Vesuvius.

Commander F. M. Barber, United States Navy, in a communication to the New York *Times* states that one important feature of the trials of the pneumatic guns on the Vesuvius was overlooked in the report. Newspaper men are usually acute, but the unanimity with which they praised the Vesuvius on the first day of the trial and condemned her on the second seems remarkable. On the first day, when the distances were quite accurately known by means of buoys, the fire was admitted to be excellent. On the second day, in good weather, when the distances were "estimated," the fire was inaccurate in point of range, and yet the gun is blamed for the inaccuracy and not the "estimated" distance. Now, which is the more likely to be inaccurate, the automatic machine or a man? I am sure that the history of all mechanical science will inevitably cause you to render a decision in favor of the machine.

The fact that the Vesuvius would require her distance to be measured and not estimated was apparent long ago. In 1888, when I was professionally employed by the Pneumatic Dynamite Gun Company, I gave the question of accurate range finding on the Vesuvius a great deal of serious thought, because the question is an absolutely vital one with guns mounted as her's are. On board of men-of-war a sextant is ordinarily employed, using the highth of a mast or the length of the ship as a base line, or with an observer aloft measuring the distance from the target to the horizon; but the Vesuvius is very low in the water, is very narrow, and has only an apology for a mast, and the foregoing or any other sextant methods are obviously of no value. The length of the boat cannot be used, because she fights bow on, and yet with her curved fire it is far more necessary to know the range than with any other ship, gun or torpedo. I studied all the other known methods in vain, and then tried to invent something, but I could devise nothing that appeared to me practicable either in the plain table line or any other. At this time Lieutenant Fiske of the navy had his attention drawn to the problem that was puzzling Captain Zalinski and myself, and after some thought he devised his electric range finder, using the beam of the Vesuvius as a base, and by means of electricity getting a far more sensitive method of angle measuring than could be mechanically graduated on an arc. I was at once struck with the possibilities of this new invention, and Captain Zalinski carried on experiments with it in November, 1888, at Fort Hamilton, both by day and night, with results which were remarkably accurate up to all ranges of the Vesuvius' guns. As a result of these experiments a company was formed which is now, I believe, successfully exploiting the Fiske range finder in all the principal navies of the world for use with ordinary guns, but I have paid no personal attention to the matter since that date. The idea was there, and this was sufficient for my purposes at the time. I believe there are now several rivals in the field. Like all similar systems of the angular measurement, the longer the base the more accurate the result will be, and possibly in actual trial on board the Vesuvius, with her narrow beam, it might not be so successful as I hoped in 1888 that it would be. The Baltimore *Sun* report of the trial stated that it would not have been successful, but I have seen no mention of it in the other papers. Admitting that this was the prevailing opinion on the part of everybody at the trial, it appears to me to only point more clearly to the fact that something must be devised which will measure the distance, and it is a poor compliment to American ingenuity to admit that it cannot be done and to blame the gun in consequence.

As you pointed out in the latter part of your editorial, it is the pitching and rolling that will bring out the Vesuvius' weak points; but so it will be with the weak points of the Cushing when she gets her torpedoes; so it is now with the batteries of ordinary vessels, and there is no reason why the guns of the Vesuvius should fail to do their perfect work until such conditions are reached, and they were not reached last week. When they are reached Lieutenant Paine's linked projectile will be brought forward to overcome the difficulty; but there is a vast deal of instruction and information to be obtained with the Vesuvius as she now is with her present guns and projectiles, and the black eye which she undoubtedly has received in the public press from last week's trials can only be accounted for from the fact that the reporters did not seriously consider the problem. A new Vesuvius could be much improved, but this one has done herself no discredit thus far.

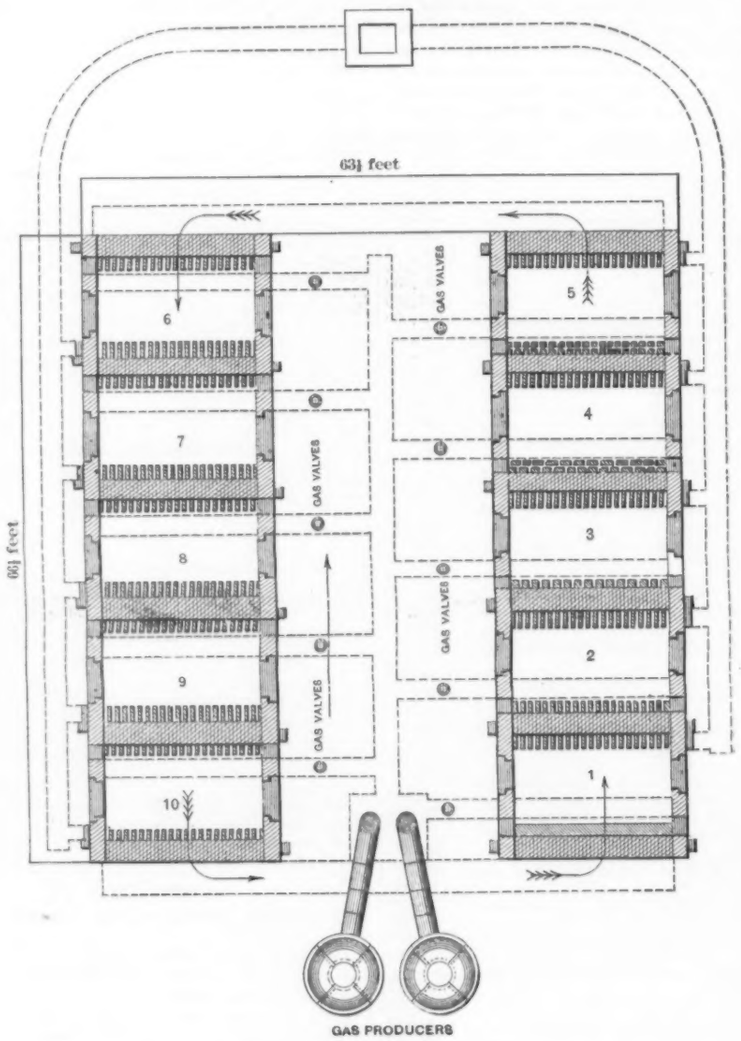


Fig. 1.—Ground Plan.

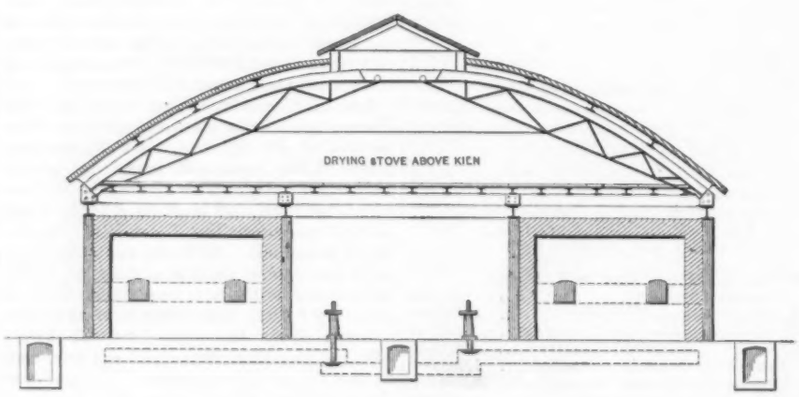


Fig. 2.—End Elevation.

DUNNACHIE'S CONTINUOUS REGENERATIVE GAS KILN.

The Dunnachie Gas Kiln.

The application of the regenerative system to the firing of fire-brick kilns has been developed in England, where the Dunnachie Continuous Regenerative Gas Kiln has been used for a series of years at the works in Glenboyd of the Union Fire-Clay Company, Limited, of Glasgow, whose representative in this country is D. R. Lean of Pittsburgh. The Dunnachie kiln is designed in two modifications, the first being the continuous kiln and the second what is called the composite kiln. A series of chambers are used, their number being so chosen that ample time is given to cool each in rotation, draw it, refill, steam, and, if necessary, repair. The accompanying engravings show the design and in detail the construction of the kiln. Fig. 1 is the ground plan of a plant of ten chambers, equipped with two gas producers capable of converting into gas each about 4 hundredweight of slack per hour.

In order to understand the mode of operation let it be supposed that No. 1 chamber, and also No. 2, be filled with bricks ready for firing. The gas is turned on and burned with cold air drawn from No 10; the degree of heat obtained by the use of cold air is not enough to burn refractory fire bricks, but it is sufficient to make No. 1 a regenerator for No. 2 for the start off, leaving the burning of No. 1 to be completed on the next round. While No. 1 is burning, the waste heat passes through No. 2. No. 1 having been made as hot as it can be made, No. 2 is put on full fire, the waste heat passing through No. 3, or even 3 and 4 if need be, before it goes to the chimney. No. 2 while burning draws its air from No. 1, where it is highly heated before meeting with the gas in the burner of No. 2. No. 2 being burned off, becomes in turn the regenerator for No. 3, and so on round the circle. When sufficiently cooled down, each chamber in turn is emptied and refilled. No. 1, however, having been imperfectly burned for want of hot air at the start off, is left as first stacked, till it is burned a second time, after which it takes its place on equal terms with the rest, and the burning, cooling, drawing, and resetting goes on continuously. The gas is let on or turned off from each chamber by a separate gas valve, and the air flues between each chamber are controlled by dampers, so that the quantities of air and gas may be regulated with great accuracy. The steaming preparatory to full firing is effected by jets of gas, coming up all over the floor, from special gas flues provided for the steaming stage. The steam is all expelled by the crown of the kiln, through the openings on the top or ends, which are opened for steaming and closed for full firing. A chimney of 100 to 120 feet high, if properly placed, is sufficient for draft, but if a blower is used for the air the chimney may be dispensed with, or a shorter one employed.

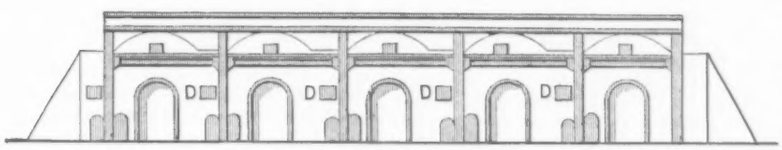


Fig. 3.—Front Elevation.

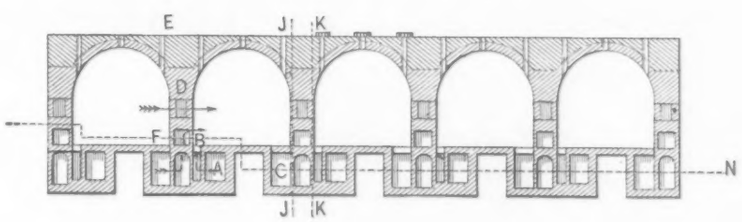


Fig. 4.—Longitudinal and Vertical Section.

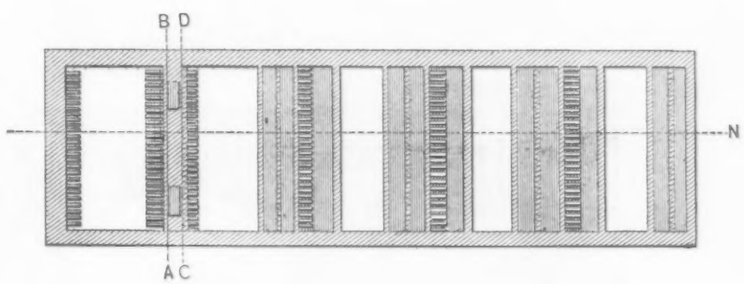


Fig. 5.—Plan.—In Section on Line N of Fig. 4.

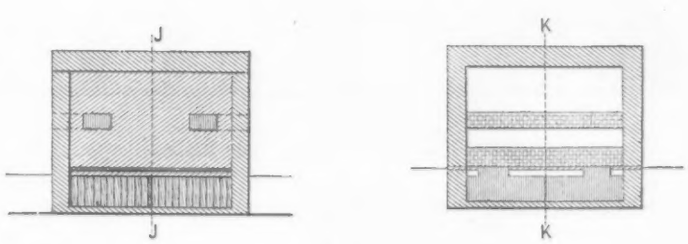


Fig. 6.

Vertical Transverse Section on Line A B of Fig. 5. *Vertical Transverse Section on Line C D of Fig. 5.*

DUNNACHIE'S CONTINUOUS REGENERATIVE GAS KILN.

The space between the two rows of chambers is shown in Fig. 2 as covered over with an iron roof. This space, however, may be covered or not, as circumstances require. The roof is supported on the kiln binders, which makes it not costly. In some cases a roof of wide span may be used to cover in the entire structure. At the Star Works it is used both ways. The green bricks from the stoves are delivered under this roof by an endless chain, and are thus protected in all weathers, the brick being under cover from the time it is molded till burned.

Fig. 3 shows the front elevation. Fig. 4 is a longitudinal vertical section. The burning is from left to right. The gas is admitted through the flue A, and passes into the burner B, where it meets the hot air from the adjoining chamber, entering by the flue F. From the flue C the draft may be passed on either into the next chamber or to the chimney, as may be desired. By this arrangement the spare heat is deposited in the unburned chambers in front, which are thus gradually prepared for full firing, and the heat of the burned-off kiln is taken up and carried forward by the air which supports combustion, so that nothing is lost. Fig. 5 is a plan in section corresponding with and explaining Fig. 4 on the line N. Fig. 6 shows the two sides of the dividing wall, with the mode of receiving and distributing the air on the lines J J and K K.

The hot air and gas meet at the floor level, where they burn with an intense heat. Both air and gas being under control, may be increase or diminished in quantity at will, and may be proportioned to give any quality of flame required. The flue D is used to draw air from one chamber to another at a higher level, thus effectually exhausting the heat of the burned-off kiln, and, at the same time, shifting the intensity of the heat nearer to the back part of the burning kiln. When required the flue D may also be used to admit cold air (by a simple arrangement of dampers) in sufficient quantity to reduce, if need be, the intense heat of the front, and permit of the back part of the kiln being hard burned without injuring the front bricks. The openings E are only used for steaming and cooling. The air for combustion may be either drawn in by the chimney, or forced in gently by means of a blower.

As regards efficiency and economy, it may be stated that the heats obtainable are "steel-melting heats," and are far beyond the requirements of any brick or pottery kiln. The heat, however, is under control, and can be mellowed down. It burns the Glenboig Star Fire Bricks in a manner superior to coal burning, and with a saving of from 50 to 75 per cent. in fuel

and 50 per cent. in time of full firing. It also saves labor, and has reduced the tear and wear of kilns to a trifle, as compared with that of coal-burned kilns.

The Twelve-Inch Gun.

The first 12-inch steel gun made in the United States has just been sent from the Watervliet Arsenal to the Sandy Hook proving ground for testing. This gun is designed for seacoast defense, and, with the 12-inch steel mortars that are also now being built, it forms the first practical result of the policy outlined by the Board of Fortifications as early as May, 1885. The gun weighs 52 tons. It is 36.66 feet long, and the length of the bore is 34 feet. Its charge is 440 pounds of powder, and its projectile weighs 1000 pounds. The initial velocity of the projectile will be 1940 feet per second, the muzzle energy 26,000 foot tons. At the muzzle this projectile will penetrate 32 inches of iron, and at a distance of 2 miles 20 inches. The tube and jacket forgings for this gun were purchased at La Creusot, France, and the remaining forgings were obtained from the Midvale Steel Works. Although it was necessary to go abroad to purchase the largest forgings, owing to the fact that substantial progress in the manufacture of steel forgings in this country had not then been made, it will not be necessary to do so in the future, American manufacturers having in the meantime acquired an experience that enables them to produce the largest forgings.

Unreliable Figures.

In a recent issue of the *National Labor Tribune* appeared a statement signed by Nick Dale, which purported to give the profits for one year of some of the prominent iron and steel manufacturing firms of Pittsburgh. As this paper is printed in that city and is the official organ of the Amalgamated Association of Iron and Steel Workers, that statement was no doubt issued at this time with the idea that its publication would have some influence on the actions of that body as regards the new scale for the coming year. As is no doubt known, some of the Southern delegates and some from the mills in Eastern Pennsylvania came to the convention prepared to make a fight for $6 per ton for boiling on a 2-cent card instead of $5.50, the rate now in force. In order to back up their arguments for an advance in the scale, they could point to the article in the *Labor Tribune*, wherein it is stated the profits of the iron and steel manufacturers for the year commencing June 1, 1890, and ending on May 31, 1891, have been enormous. If the iron and steel manufacturers of Pittsburgh made as much money in the year mentioned as Nick Dale says they did, we have no doubt whatever but that they would be perfectly willing to grant an advance of 50 cents per ton for puddling. Like many other statements which have emanated from Nick Dale's fertile brain, this one is absurd and no reliance should be placed upon it whatever.

In his remarkable statement Nick Dale says that A. M. Byers & Co. made during the year 14,000 tons of muck iron, of which 10,000 tons were finished, on which they made a profit of $1,000,000. The sworn statement filed in the office of the City Treasurer at Pittsburgh shows that their total sales for the year amounted to $1,020,704. In the face of this, Nick Dale says their profits amounted to $1,000,000. Spang, Chalfant & Co. are credited by Nick Dale with a profit of $1,000,000 on an output of 11,200 tons of muck bar and 20,000 tons of steel and wrought iron pipe. Jones & Laughlins, Limited, are credited with a net profit of $2,500,000 on 175,000 tons product, or an average of about $15 per ton. Lindsay & McCutcheon, proprietors of the Star Iron Works, in Allegheny, made 19,000 tons of muck bar, of which they finished 10,000 tons. On this amount Nick Dale says they had a profit of $50,000. On the other hand, the Oliver Iron and Steel Company are stated to have made 6500 tons of muck bar in the Eagle Rolling Mill, which they operate under lease, the profit on which Nick Dale puts at $13,000. Why there is such a wide discrepancy in the profit on muck bar made by this firm and that made by other firms Nick Dale does not state. We might go on down through the entire list of firms whose profits Nick Dale has been guessing at with very poor success, but we think the above is sufficient to show that the iron and steel firms of Pittsburgh have not made anything like the profits Nick Dale says they have. In order to correctly ascertain the profits of any concern, it would be necessary for Nick Dale to have free access to the books of that concern. As this priviledge has not been extended Nick Dale, and his figures are simply guesswork, and very poor guesswork at that, it is not likely that any person will be deceived into believing them. They are totally unreliable and unworthy of consideration.

The Campbell & Zell Company of Baltimore are full of orders for Zell boilers, among others being an additional order for 500 horse-power from the Baltimore Sugar Refinery Company, Curtis Bay, Md., making a total of 2000 horse power erected at their plant.

The Lakeside Nail Company.

Notwithstanding the depression in the steel cut-nail trade, which has caused so many factories to be shut down indefinitely, the works of the Lakeside Nail Company at Hammond, Ind., are running to their full capacity. The company have one of the most modern nail factories in the country, the first nails having been turned out by it less than four years since. The present owners have been operating the works for a little more than a year and have put them in first-class condition. The machinery and equipment were originally furnished by builders of high reputation. The Lewis Foundry and Machine Company of Pittsburgh built the rolling mills; A. J. Sweeney & Son of Wheeling supplied the nail machines, and Hoovens, Owens & Reutzler of Hamilton, Ohio, built the Hamilton-Corliss engines now in use.

The works occupy a plot of 35 acres, located on the Grand Calumet River, about 5 miles from its entrance into Lake Michigan at the new town of Talleston, now being laid out by the Chicago packing interests. This part of the river is being restored to navigable condition, which will be of much value to the nail company and other Hammond manufacturers. The nail company have 1000 feet of frontage along the river. They have excellent railroad facilities also, being connected by tracks into their grounds with the Fort Wayne, Erie, Monon, Michigan Central and Chicago and Calumet Terminal roads.

The nail factory of this company is an exceptionally fine building, 336 feet long by 120 feet wide, constructed with brick

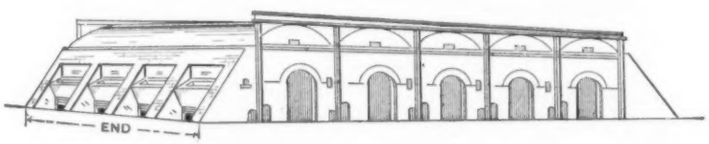


Fig. 7.—General View.

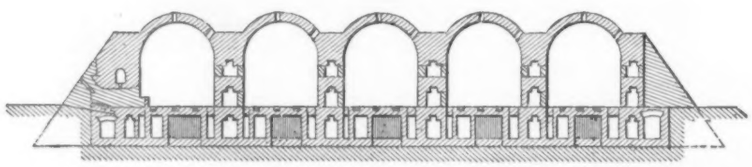


Fig. 8.—Longitudinal View.

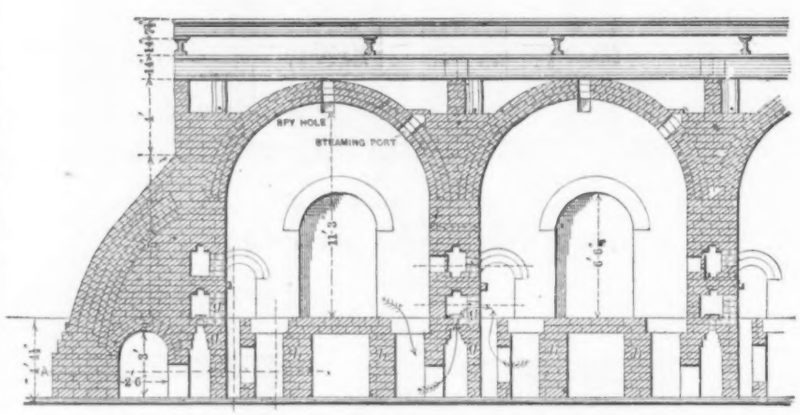


Fig. 9.—Detail Section of Two Kilns.

DUNNACHIE'S CONTINUOUS REGENERATIVE GAS KILN.

walls, decked roof and an abundance of windows in both side walls and roof. It contains 101 nail machines, nearly all automatic, which are arranged on an elevated floor in the center of the building, leaving plenty of room on both sides to handle the nails when cut. One end of this building is used as a warehouse, from which nails are loaded directly on cars, the floor being on the level of a freight car floor. The usual output of this factory is 1000 kegs per day, but at times this is exceeded.

The plant embraces a well-equipped steel converting department built by J. P. Witherow & Co. of Pittsburgh. There are two 3-ton converters, with a capacity of 250 tons of steel per day. Connected with the steel department is a fine blooming mill built by the Lewis Foundry and Machine Company. The steel-making appliances have been examined by experts recently, who found them in perfect condition. At present, however, the company are not manufacturing steel, but are making their nails from purchased steel. When the company began operations they encountered the usual difficulties experienced in organizing a new force of workmen, but by perseverance and the utmost care at every stage of the work all troubles were overcome, and their product now is fully equal in quality to that turned out by the old-established factories of national repute. They have marketed over 200,000 kegs of nails in the Northwest and are constantly adding new names to their list of regular customers. The officers of the company are George S. Griscom, president, and T. F. Woodman, secretary and treasurer. Their Chicago office is in Room 647, Rookery Building.

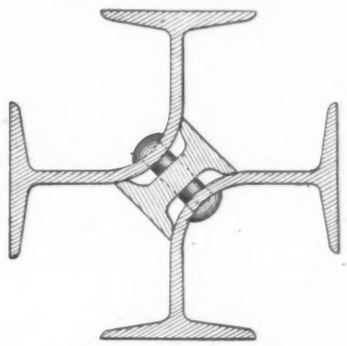


Fig. 1.—Column Formed of I-Beams.

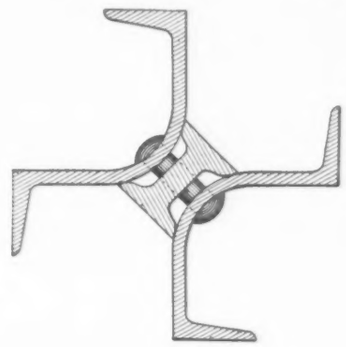


Fig. 2.—Column Formed of Z-Shapes.

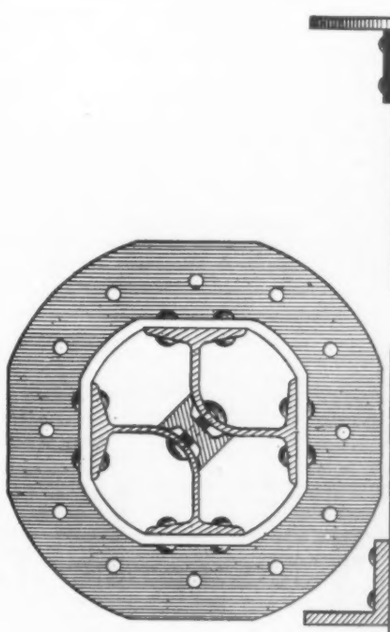


Fig. 4.—Plan.

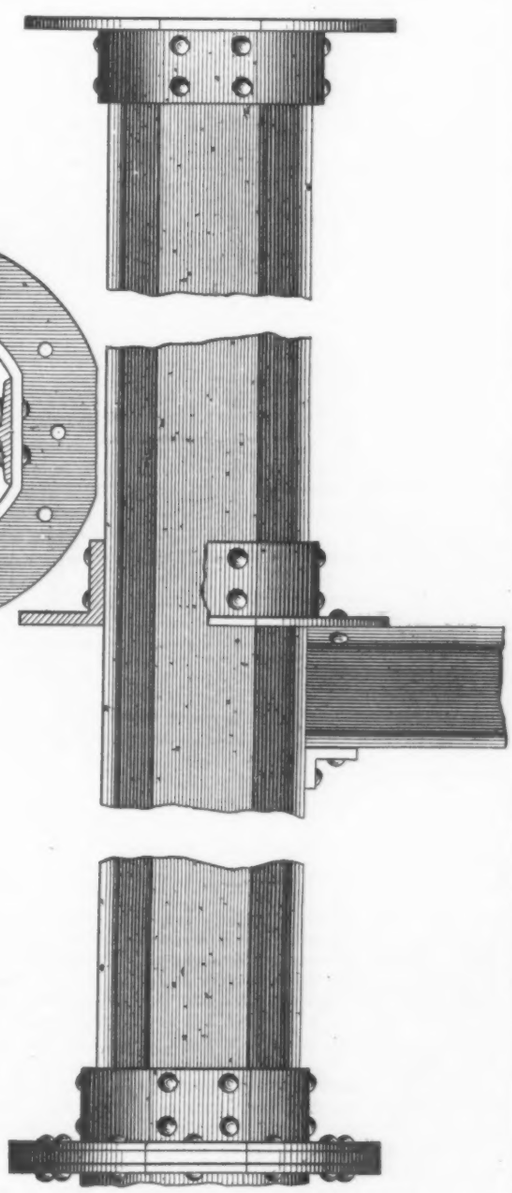


Fig. 3.—Elevation.

THE LARIMER PATENT COLUMN.

The Larimer Patent Column.

Illustrations are herewith given of a new form of column invented by J. M. Larimer, manager of the Chicago house of Jones & Laughlins, Limited. This column is the latest practical acquisition to the present style of entire steel construction in the erection of buildings, and is adaptable to any structure where strength and economy of space are desired, its three principal points being strength, lightness and compactness. The method of forming the Larimer column is so simple that a very brief description needs to be added to the illustrations. Either I beams, Fig. 1, or Z shapes, Fig. 2, are bent into a curved form longitudinally, and two of them are then bolted together, with a metal filler inserted to keep them rigidly in place. It will be seen that steel columns can thus be quickly and easily made from beams, obviating the necessity of rolling special shapes and thus securing obvious advantages. The peculiar but simple construction of this column distributes the metal where it will be of most service and reduces the sectional area to a minimum. It is particularly adapted to buildings in which economy of space is an object, as the diameter when fireproofed is much less than the forms generally used, thus economizing not only in space but in material. When used uncovered in any building where it is exposed to dampness it is easy to keep the entire column painted. Bracket attachments are also shown in the illustration, Fig. 3. With the use of these the column can be made of any reasonable length, as girders can then be connected at any hight and any angle. Sizes and weights can be made to correspond to requirements for loads and the position in which they are to be placed. Jones & Laughlins, Limited, are prepared to furnish the Larimer column, and will be pleased to give at their Pittsburgh or Chicago office information as to strength and weight required from data obtained by actual tests.

Among the publications announced by the Bureau of American Republics as in course of preparation are a code of nomenclature containing an authentic list of all articles of merchandise imported and exported, with their Spanish and Portuguese equivalents; a compilation of tariff laws and customs regulations; and a series of bulletins devoted to the Southern countries. These handbooks will be most useful in regulating the terms to be employed in bills of lading, ships' manifests and consular invoices, and much additional information might be given respecting the proper modes of packing for shipment to interior points from Southern ports.

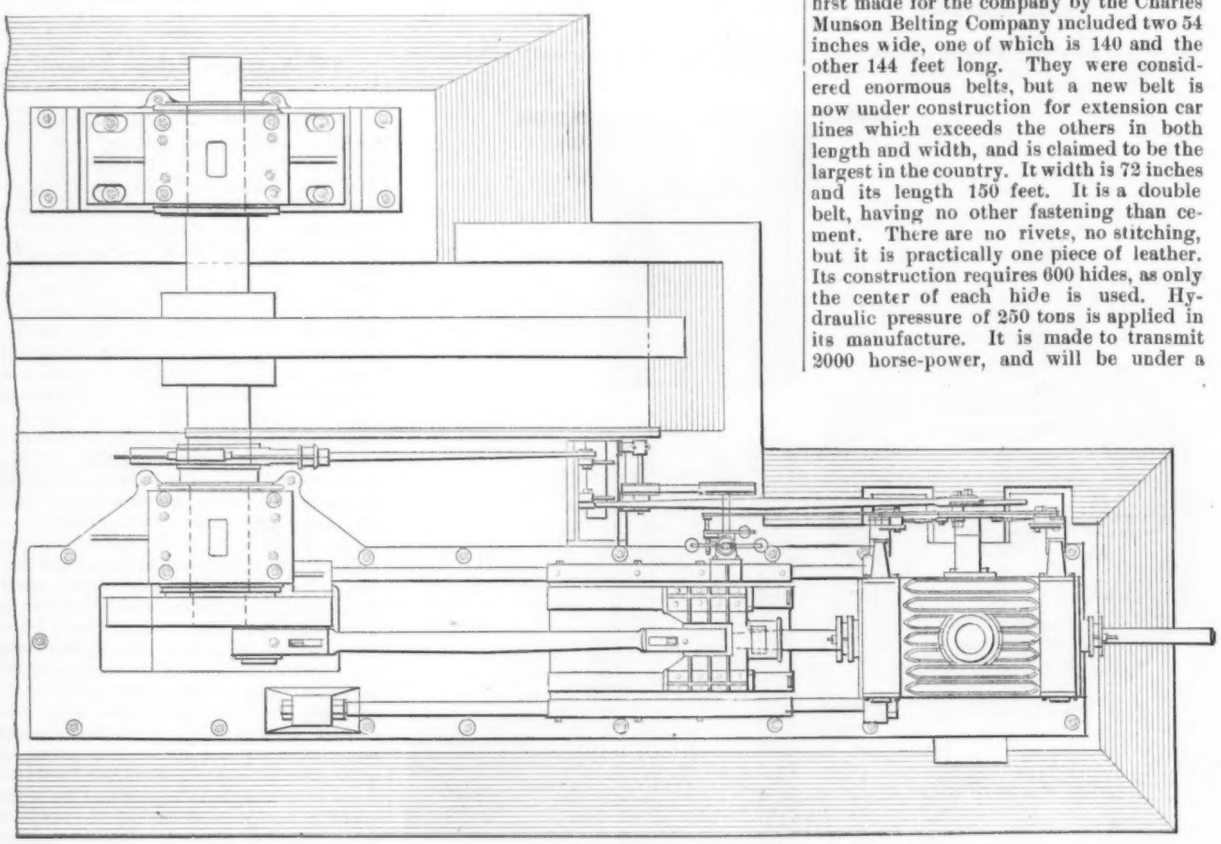
The Bass Rolling Mill Engine.

In our present issue we illustrate a rolling mill engine of new design recently built by the Bass Foundry and Machine Works, Fort Wayne, Ind., and now in operation in the W. Dewees Wood Company's mill at McKeesport, Pa. The engine was designed by A. E. Manchester, superintendent of the Bass Machine Shop. Careful attention has been given to the proper proportioning of the details to withstand the unusual strains due to rolling steel.

The cylinder is 30 inches bore and 48 inches stroke. The exhaust chest is separated from the barrel 4 inches. This space, as well as the space between the cylinder barrel and lagging, is insulated with a non-conducting filler. The lagging is made of cast iron. The steam and exhaust valves are ground on dead centers and the valve chests scraped to fit. The valve gear is strongly built, and all of the cranks on the side of the cylinder are hammered iron. The valve stems are mild forged steel, and have collars bearing against the hubs of the bonnets. The cut off is effected up to four-tenths of stroke automatically by the Porter governor; beyond that point the closing of the valve is performed by the eccentric. By means of a flange on the bottom of the cylinder it is doweled and bolted to a bed plate extending to the main bearing.

The main bearing is 18 inches diameter and 36 inches long. The boxes are faced with brass shells, lined with diagonal strips of babbitt. The boxes are flanged so as to lock over the edge of the bed casting. The cap is secured by four 2½-inch bolts, and the wrought-iron wedges for adjusting the side boxes have each two 1¼-inch lifting bolts. The jaws of the main bearing are cast in one piece with the bed plate. The bed plate is closed over on top and as far as possible on the bottom.

Extending from heavy ears on the cylinder to standards adjacent to the main bearing are two 7-inch wrought-iron bars. In order to insure additional stiffness these rods are bolted vertically and sideways to the guide stand. This stand is bolted and doweled to the bed plate. The crosshead is cast of steel and fitted with bronze gibs. The cast-iron surfaces where the crosshead travels are scraped smooth. The connecting rod is fitted with straps, gibs and keys. In addition a through bolt is placed directly behind each box. In order to prevent burring the key so that it could not readily be removed, a channel $\frac{1}{16}$ inch deep and 1¾ inches wide is milled to accommodate the point of the set screw.



Plan.

THE BASS ROLLING MILL ENGINE.

The balance wheel is 25 feet diameter, and weighs 60,000 pounds. It is made in ten segments. The rim is secured by wrought-iron links shrunk in the sides at each joint. The arms are secured in the center by keys and reamed bolts. Between the bearings the crank shaft is 20 inches diameter. Over all, the crank shaft is 20 feet long, and weighs 14,000 pounds. The outboard bearing has the same size boxes and adjustments as the main. It is keyed fore and aft in a heavy sole plate, and has foundation bolts extending through the sole plate down into the foundation. The sole plate has heavy lugs extending on the side to catch the sills for the roll train. This ponderous engine is held down to a foundation 14 feet deep by 32 3-inch bolts.

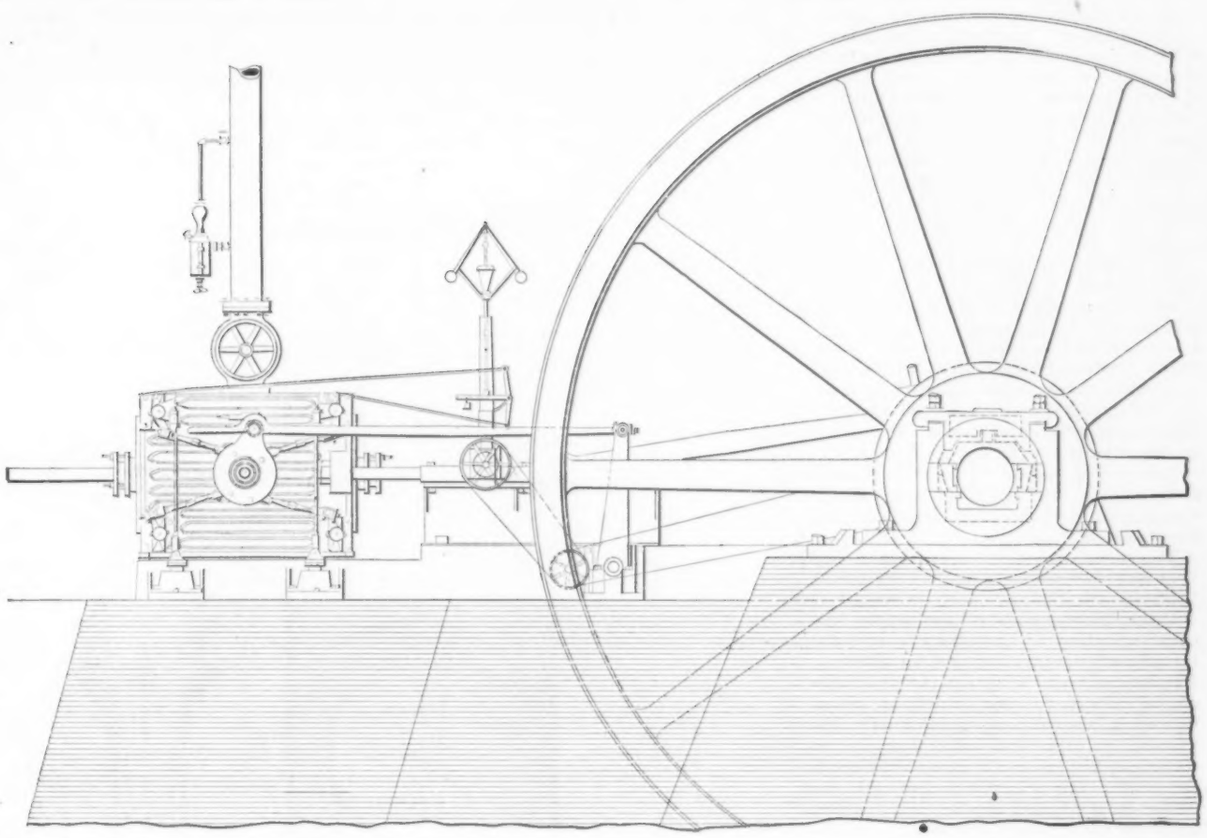
This engine has evoked considerable interest among the rolling mill companies near Pittsburgh, and many favorable comments are made upon the strength and workmanship. The Bass Foundry and Machine Works have shipped a second engine to the W. Dewees Wood Company, which is similar in size and design to the one already in their rolling mill.

Enormous Belts.

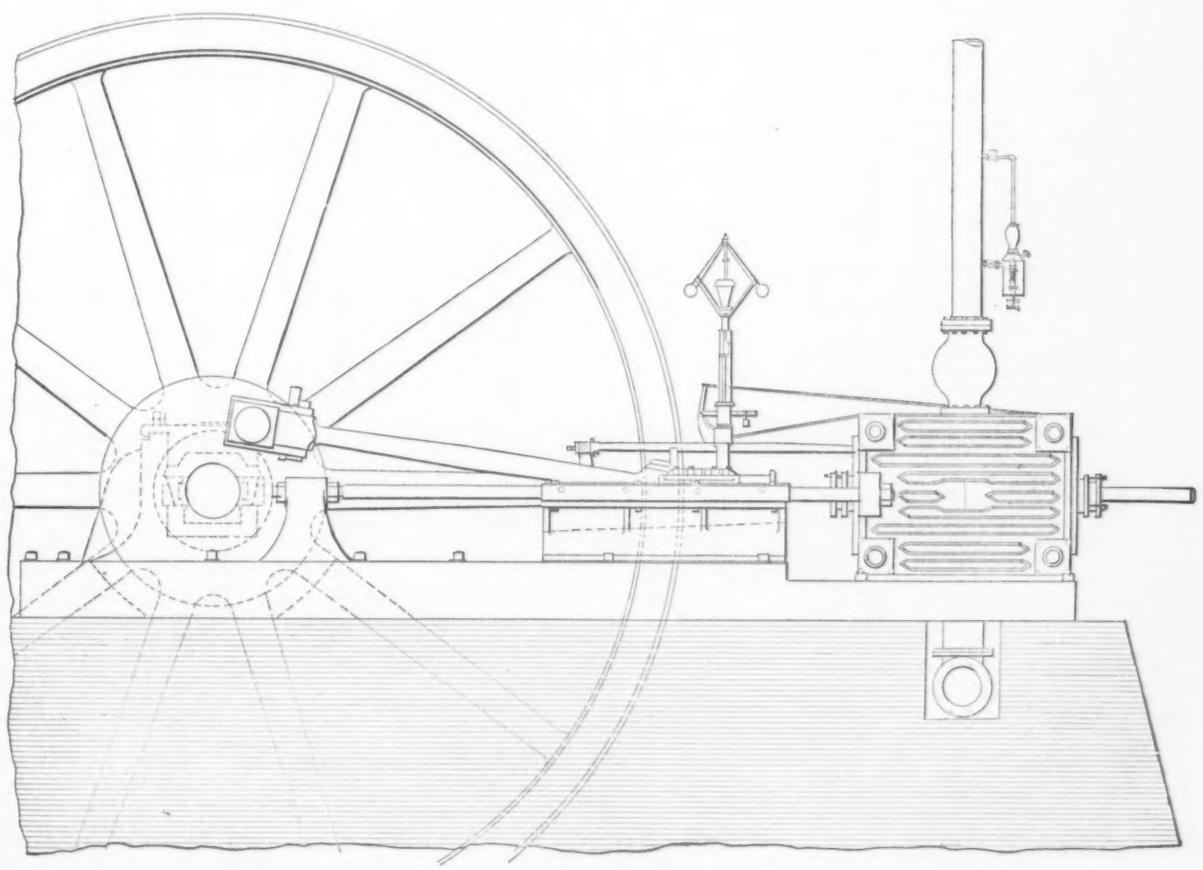
The Charles Munson Belting Company, 28 to 36 South Canal street, Chicago, have recently furnished some huge leather belts to the Missouri Street Railway Company of St. Louis. The street cars of this company are run by electric power, and very large belts are required in their electric plant. The main shaft is 9 inches in diameter, 120 feet long, including two large tightener pulleys so adjusted with screws as to get any tension required on the belts, this part of the machinery having been designed by H. W. Hill of the Hill Clutch Works, Cleveland. The belts first made for the company by the Charles Munson Belting Company included two 54 inches wide, one of which is 140 and the other 144 feet long. They were considered enormous belts, but a new belt is now under construction for extension car lines which exceeds the others in both length and width, and is claimed to be the largest in the country. It width is 72 inches and its length 150 feet. It is a double belt, having no other fastening than cement. There are no rivets, no stitching, but it is practically one piece of leather. Its construction requires 600 hides, as only the center of each hide is used. Hydraulic pressure of 250 tons is applied in its manufacture. It is made to transmit 2000 horse-power, and will be under a working strain of at least 110 pounds to the square inch. When shipped from the factory it will not be in complete belt form. The ends will be prepared for splicing, and when it is in position on the pulleys it will be drawn tight with clamps and the ends cemented, the parts joined becoming as firm as any other part of the belt. Its weight is 3000 pounds.

The Charles Munson Belting Company have deservedly won a very high reputation for the quality of their belts. They use none but the finest material obtainable, have a well-equipped factory with the most complete facilities, and bring to bear upon their work the best combination of skill and intelligence. They are under agreement to take the entire product of leather from the large tannery of A. Groetzinger & Son of Allegheny, Pa.

A coal seam 48 feet thick has been discovered on the Great Northern Railroad in Australia.



Rear Elevation.



Front Elevation.

THE BASS ROLLING MILL ENGINE.

THE HERBERTZ CUPOLA.

BY J. B. NAU, NEW YORK.

The cupolas generally used either for melting iron or for any other purpose are cupolas blown through one or several rows of tuyeres inserted at some distance above the hearth. The pressure of the blast varies in most cases from ¼ pound to 1 pound, and the blast is obtained by blowing engines or blowers driven through belting and shafting by special steam engines. Such a plant, requiring as it does many mechanical appliances, consequently subject to continual care and repairs, is expensive. The Herbertz cupola, instead of being blown by blast forced from below through the melting material, is provided at its upper end with a steam jet pipe, which in action creates a vacuum of from 3 inches to 4 inches of water in the upper region of the cupola, while the air is allowed to enter freely at the lower part through an annular opening between the movable hearth and the upper shaft.

The movable hearth, as shown in Fig. 1, is mounted on four screws which by their common action lower or raise it at will and thereby allow of a complete and easy regulation of the quantity of blast introduced through the annular opening. The screws work either in the standards of the cupola, as seen in Fig. 1, or are carried on a special car together with the hearth, so that this latter can be removed at any moment from underneath the shaft. The steam jet is applied in the center line of the smoke pipe, which connects the cupola either directly with a special stack or is built like the downcomer of a blast furnace, and connects the cupola with a horizontal underground flue leading to any chimney. The top of the cupola is provided with a hopper hermetically closed while the melting is proceeding and only open at regular intervals and for a very short time, when the charge is being introduced.

The bottom of the hearth is provided with a door turning on hinges and kept tight by a lock. This door, once lowered after the melting is done, turns around the hinges and the contents of the cupola are dropped into an ash pit, where, after having been cooled with water, the unburnt coke can be collected and saved for the lighting of the cupola in the next melting.

Three tuyeres are placed all around at the level of the bottom of the hearth. These tuyeres, as we shall see later on, are plugged up with sand during the melting, but are used before the melting in the kindling of the fire and to give access to the air necessary for the combustion.

The shaft is provided at two different levels with bullseyes, through which the fire can be watched.

The application of a steam jet to create draft in the cupola has many advantages. The only mechanical appliance required is a small boiler supplying the necessary steam for the ejector. No blowing engine or steam engine with blower, shafting, pulleys, belts, no blast pipe connecting the blower with the cupola, is necessary. The only repairs are those on the boiler and steam pipe, very light indeed, without mentioning the fact that oil for lubricating will be entirely dispensed with. But beside these already important advantages some other features are met with. Most of the blowers, running at a speed of from 1000 to 1200 revolutions or more per minute, produce sometimes noise, which often can be heard at a great distance. The Herbertz cupola runs without any appreciable noise and can be established in any populous center without the slightest inconvenience to the neighborhood. Its top being closed, no sparks or flame are thrown out. The repairs to the movable hearth are very easy and can be done outside.

In the United states it is as yet little know. For some time, however, tests have been made with it at a car-wheel foundry in Elizabethport, N. J.

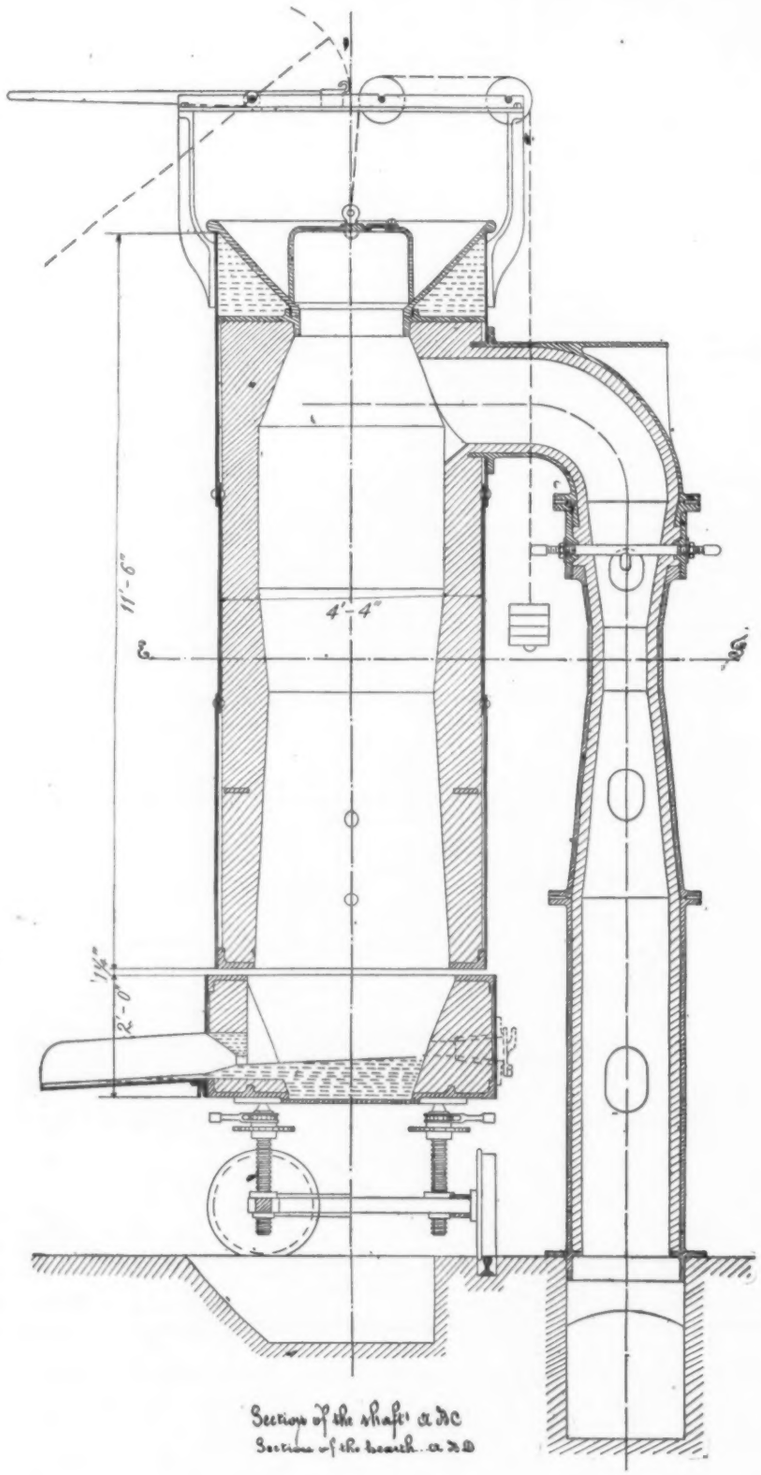


Fig. 1.—Section of Iron Cupola.

THE HERBERTZ CUPOLA.

This cupola is very well adapted for the melting of pig iron. The very reduced consumption of coke, claimed by the inventor to be as low as 4 to 5 per cent. of the weight of iron (or in other words 1 pound of coke would be enough to melt 20 pounds of iron), leads to the conclusion that the combustion of coke must be complete, or that the coke must be burnt completely to carbonic acid, and thus generate the greatest possible amount of heat. In order to prove this, test heats have been made in Europe, and the analyses of the escaping gases showed that in most cases the whole amount of carbon was burnt to carbonic acid, while in a few other cases a very small proportion of carbon burnt to carbonic oxide. In one of these test heats the mixture in the cupola was 1050 kg. of Luxemburg foundry iron No. 3 and 450 kg. of foundry scrap, a total of 1500 kg., or 1.5 tons.

The melting coke was air dry and contained but 3 per cent. of water, 6.8 per cent. of ash and 1 037 per cent. of sulphur; 190 kg. of filling coke was put in the cupola and on top of it 1000 kg. of pig iron. The total amount of coke used, including lighting coke, was 215 kg. to 1500 kg. pig iron. After the fusion was done, 67 kg. of coke was taken out and could be used again for the next day's charge, so that the real amount of coke used was only 215—67 = 148 kg., or 9.9 per cent., whereas the real amount of melting coke was only 5 per cent.

A careful weighing of the iron cast showed that 1460 kg., or 97.33 per cent of the original iron charged, was obtained, constituting a loss of only 2.66 per cent. The temperature of the molten metal was high, and amounted in part to 1300°. The escaping gases had the following composition:

	Carbonic acid.	Carbonic oxide.	Oxygen.	Nitrogen.
Before the steam jet was acting.....	7.1	0	7.1	85.8
Five minutes after steam jet was acting.....	13.1	0	6.5	80.3
Twenty-five minutes after steam jet was acting.....	9.25	0	7.0	83.75
At the end of the cast (after 35 minutes).....	13.3	0	6.3	80.4
Average.....	10.71	0	6.73	82.60

Another test heat with thoroughly wet gas coke was made. This coke contained nearly 20 per cent. of water and 7.5 per cent. of ash. About 12.7 per cent. of it was used (lighting and melting coke together). The loss in iron in this charge was only 3.45 per cent. The average composition of the gases was 11.5 of carbonic acid, 3.4 of carbonic oxide, 8.2 of oxygen, 76.9 of nitrogen. It will be seen that in this last heat carbon did not burn entirely to carbonic acid, which was probably due to the increased amount of coke that had been charged intentionally.

Nevertheless, the composition of these gases is still far more favorable than would be obtained with an ordinary blown cupola, where a certain number of analyses have shown that the escaping gases contain from 12.50 to 19.90 per cent. of carbonic acid and 4.80 to 11.73 per cent. of carbonic oxide. The analyses show furthermore that in the case of the Herbertz cupola the fuel is thoroughly utilized and yields the maximum of heat.

To obtain such complete combustion it is necessary that the air should be in slight excess, and that this actually happens is shown by the presence in the gases of a certain amount of free oxygen. Several reasons have been advanced to explain this complete combustion of carbon to carbonic acid. The first is that the air enters the cupola all around the circumference in a thin sheet and gives rise to very uniform combustion. Another reason is the very reduced velocity with which the gases rise.

In the ordinary blown cupola these gases are pushed upward with great pressure and velocity, and the combustion under such conditions cannot be obtained entirely in the lower regions, but some of the air will reach the upper regions unburnt, where it causes the reduction of part of the carbonic acid.

The presence of free oxygen in the escaping gases of the Herbertz cupola might lead to the supposition that they have a pernicious influence on the composition of the iron. Some of the elements in the pig iron, such as carbon, silicon and manganese, for instance, might be oxidized, and by their partial elimination deteriorate the quality of the iron. Not only is this not the case, but it seems that actual practice has shown that less carbon and silicon are eliminated from the iron in the Herbertz cupola than in the ordinary blown cupola. This has been explained in the following manner: The combustion in this cupola takes place a little above the annular opening and no flame is seen in the upper regions of the cupola, whereas in the ordinary cupola combustion takes place through the entire length of the shaft and continues in a blue flame on top. In this case all the pig iron is more or less heated and pasty before it reaches the melting zone, and surrounded by an oxidizing atmosphere, the elimination of part of its elements is easy.

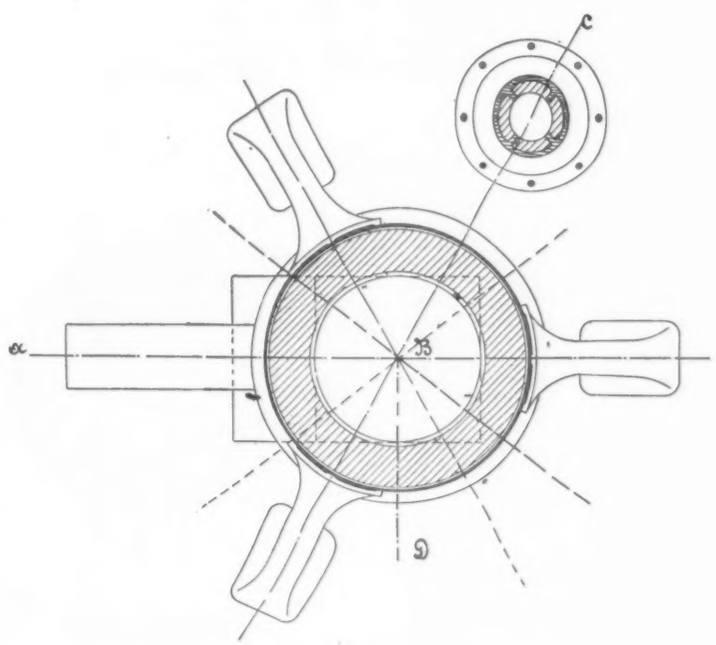


Fig. 2.—Horizontal Section.

THE HERBERTZ CUPOLA.

In the Herbertz cupola, where the combustion takes place almost entirely in the lower regions, and where the upper regions are less heated up, the pig iron better resists the influence of the ascending gases.

It must be stated at once that the above tests extended only over one single charge of 1.5 tons, lasting in the first heat 35 minutes. Had the work been continued for a certain length of time and had a greater number of charges been made, the consumption of fuel would have been considerably lowered, as for the following charge only melting coke would have been put in the cupola without any further addition of lighting coke. Then, if five consecutive charges had been made, we should have 190 kg. of lighting coke and 5 × 75, or 375 kg. of melting coke (at 5 per cent. of the weight of iron), or a total of 565 kg. And as 67 kg. of coke have been taken out of the cupola after the charge was over, this would leave 498, say 500, kg. of coke really burnt, which is equal to 6.6 per cent. In other words, 1 pound of coke would melt 15.15 pounds of iron.

In the cupola working since a few weeks at Elizabethport the consumption of coke for the melting proper amounted during the tests to 6 per cent. The cupola is rated as a 2 ton, melting 2 tons an hour. The outside diameter of the hearth is 4 feet 7 inches, whereas the shaft has an outside diameter of only 4 feet 4 inches, and the total hight from bottom plate of hearth to top of cupola is 13 feet 9 inches, when hearth and shaft are in contact with each other. The castings made during the tests were car wheels and the mixture of iron put in the cupola was the same mixture of pig and scrap iron that had been used previously in the old ordinary cupola of the foundry, viz.: One-third No. 1 foundry iron and two-third car-wheel scrap. It was melted down with only 6 per cent. of coke, not counting the filling coke. Notwithstanding this very reduced amount of fuel the iron began to melt rapidly. Ten to 15 minutes after the steam was put on to create the draft the first iron was tapped off. It was very good and so hot that the men had to wait a few minutes before casting it into the molds. Though the iron mixture used in this test was the same as has always been made in the old cupola, it must be stated that the castings obtained were too soft for car wheels and presented very little chill on the tire. In order to obtain a better chill it was deemed advisable to use nothing but car-wheel scrap on the second day. The result showed a marked improvement on the first day's work; the chill was deeper and better. On the third day the mixture was one-fourth No. 3 foundry iron and three-fourths average foundry scrap. The use of this mixture constituted a large economy over what had been done in the ordinary cupola and with it better results were obtained than with a mixture of one-third No. 1 foundry and two-thirds car-wheel scrap. The castings obtained were very tough and dense with $\frac{7}{16}$ inch chill. The metal too hot to be cast immediately after tapping was very pure throughout the cast.

The charge on this day was as follows:

Filling coke, 576 pounds.
Melting coke, 6 x 72, = 432 pounds.
Limestone, 6 x 15, = 90 pounds.
No. 3 foundry, 6 x 300, = 1800 } 7200 pounds.
Foundry scrap, 6 x 900, = 5400 }

The hearth in the cupola used at Elizabethport is mounted on a small car. This hearth, prepared and dried outside, was filled with wood shavings, wood and coke on top to the upper level. It was then pushed under the shaft, and raised by means of the screws until it came in contact with its lower rim. Filling coke was then charged to the level of the highest bulls-eye, and fire started through the three

tuyeres at the bottom of the hearth. After this the cupola was left to itself, working under natural draft through the three tuyeres at the bottom. When the filling coke was fully ignited the above-named charge was put on in alternate layers of iron, coke and limestone. When the filling was done the hearth was lowered enough to form an annular opening of about 1¼ inches between the lower rim of the shaft and the top of the hearth. The tuyeres at the bottom were plugged with molding sand, and the cupola again allowed to work with natural draft through the annular opening until the first iron was melting down. At this moment the steam jet was put in action. The draft, which, when no steam was applied, had been equal to about $\frac{1}{16}$ inch water column, rose at once to between 3 and 4 inches of water. From that moment on the melting was regular, hot and rapid. The top of the cupola was kept tight and only opened at regular intervals to introduce the raw materials. Lighting coke was only used at the start; all the subsequent charges were made with not more than 6 per cent. of coke, and continued regularly without any other addition. When the steam was applied, its pressure was 80 pounds. The entire charge of 7200 pounds was melted in 1 hour and 24 minutes, which corresponds to 5140 pounds of pig iron melted per hour, say 2⅝ tons, instead of 2 tons. The vacuum created in the cupola remained between 3 and 4 inches of water as long as the level was kept constant. Toward the end of the charge, when this level became lower, the vacuum fell somewhat below 3 inches. No disagreeable noise was heard while the melting was going on, nor was any spark or flame seen at the top of the cupola.

As soon as the melting was done and the last iron run out from the cupola, the bottom door of the hearth was opened and the ignited mass fell down into the ash pit, where, once the hearth pulled out, the entire content was cooled with water, and the remaining coke gathered to be saved as lighting coke in the following melting. After careful weighing of the iron cast from the cupola, it was found that the entire loss amounted to only 3½ per cent., a very low figure when compared with the ordinary loss of at least 6 per cent. in an ordinary foundry cupola. It is remarkable also that a lower grade of iron can be taken and still the same results as in the ordinary cupola be obtained. Thus the tests at Elizabethport have conclusively shown that as good results were obtained with a mixture of one-quarter No. 3 foundry iron and three quarters foundry scraps when melted in the new cupola as had been obtained with a mixture of one-third No. 1 foundry and two-thirds scrap iron when melted in the ordinary cupola. This may be explained by the reason that less carbon and silicon are eliminated from the iron when melted in the Herbertz cupola.

Herbertz Cupola Used for Melting Steel.

The first tests made in the Herbertz cupola to melt steel were attended with success. Rail ends, old files and other iron or steel crop ends were melted together with a small amount of foundry iron, and with only 8 to 10 per cent. of lighting coke. The molten metal was liquid enough to be cast easily. However, when small steel castings had to be made it was soon discovered that the metal lacked fluidity, and in order to obtain better results, it was deemed advisable to work with heated air. Fig. 3 illustrates the construction of a cupola especially adapted to this kind of work. The cupola is all its parts is entirely similar to the steam jet cupola used for the melting of pig iron, with the exception, however, that a certain number of wrought iron pipes are laid in the brick work. The air enters at the top in a circular space, and from there is sucked down at once through the iron pipes to the lower part, where it enters the cupola. By its passage through the pipes it is heated to a temperature ranging from 500° to 1100° F. and consequently the temperature in the melting zone will be sufficiently increased to obtain a thoroughly liquid steel. Bessemer steel, as well as wrought-iron crops, were melted in this way each separately and with the greatest success.

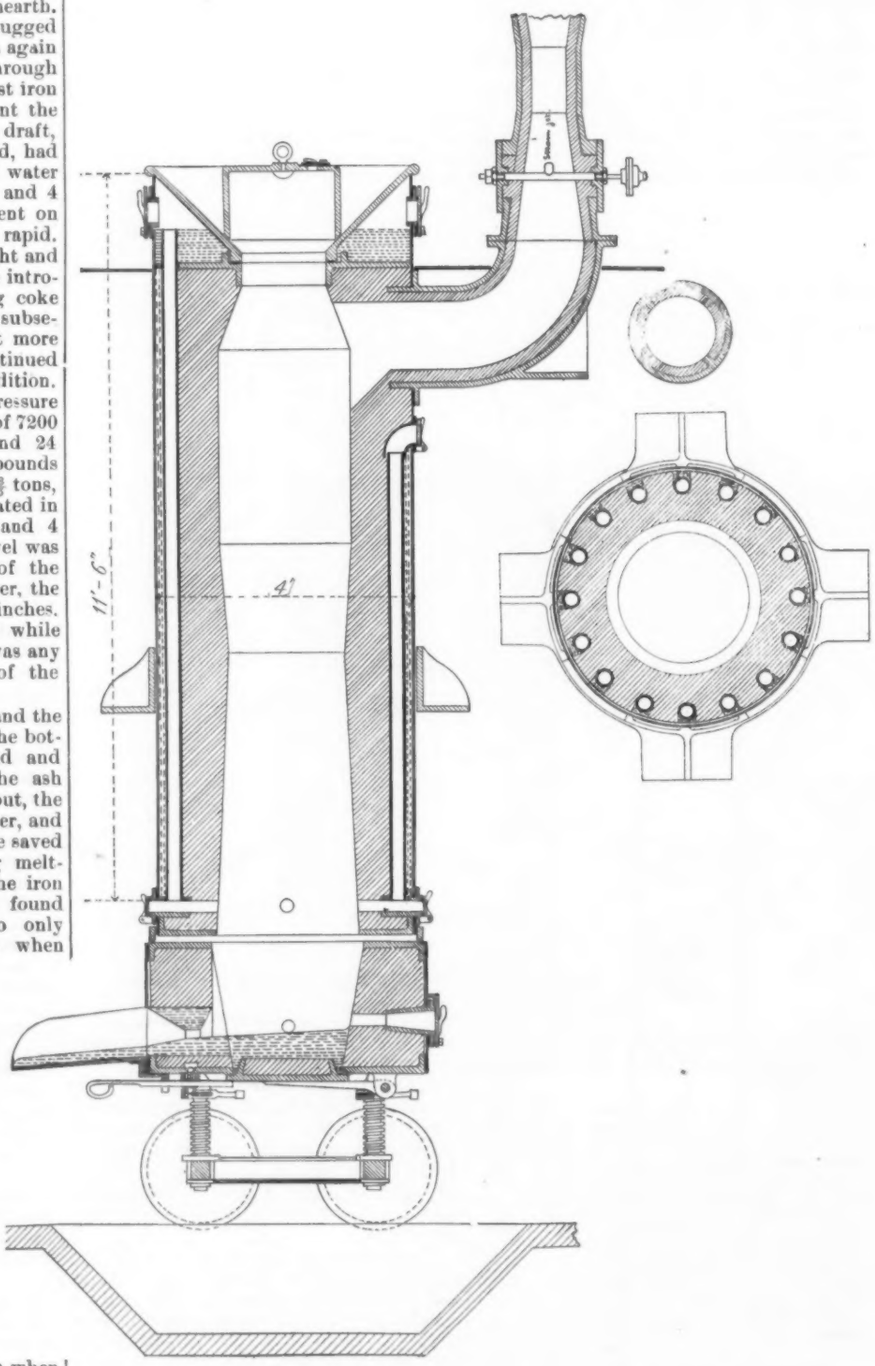


Fig. 3.—Herbertz Steel Melting Cupola.

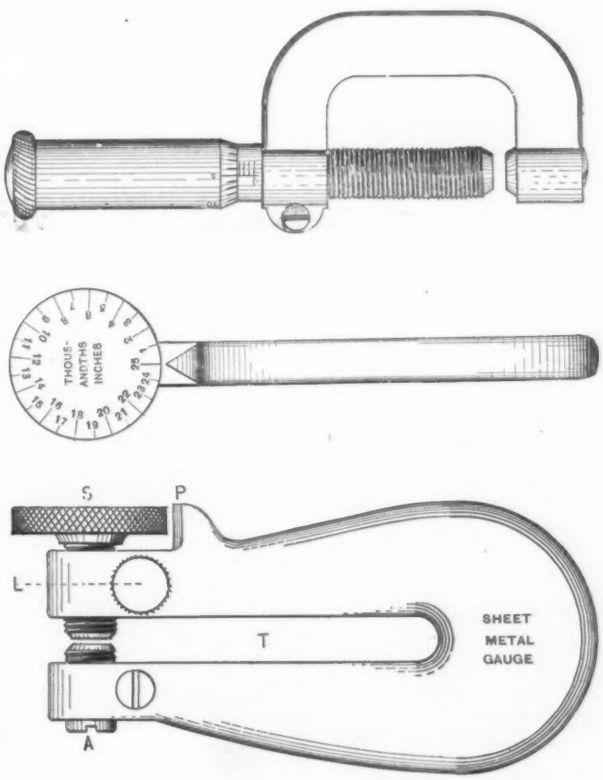
THE HERBERTZ CUPOLA.

For the casting of heavy steel castings especially this cupola is better adapted than a crucible. On account of its direct contact with the fuel at a high temperature, the percentage of carbon in the metal seems to slightly increase. No steel-melting cupola is as yet working in the United States, but on the Continent of Europe their value seems to be more and more appreciated.

For melting other metals or alloys, such as lead, copper, brass, &c., the cupola has recently been introduced in some European works. Especially bronze has been melted in an ordinary foundry cupola with the best results. The temperature required in this case being lower than in the case of pig iron, the cupola worked with natural draft and without any

use of the steam jet. The fuel economy obtained seems to be very large. The total consumption amounted to only 12 per cent., whereas in crucibles this consumption is sometimes as high as 40 per cent. The fusion, even without the application of the steam jet, is claimed to be nearly five times quicker than in the crucible furnace and the bronze obtained is even purer than the bronze remelted in crucibles. This is said to be due to the fact that during the fusion the small amount of tin often found in bronze is burnt out and escapes in the shape of a white smoke. The loss of metal during the melting seems to be slightly increased on account of the elimination of the tin. The cupolas used in the remelting of these metals are the same as those used for the remelting of foundry iron.

The architectural iron workers of Chicago are now in a ferment. The shopmen who finish the lighter portions of iron



structures demand a reduction of working hours to eight, and an advance in wages to 30 cents an hour for mechanics and 20 cents for helpers. They have organized a union, which is promised the support and co-operation of the Pattern Makers' Union and the Molders' Union in the enforcement of the demands made. A strike in this branch of the building trades would bring a great deal of work in Chicago to a complete stop, as there are now few buildings of any importance on which there is not more or less work of this kind.

Contracts for the manufactures building and the woman's building were awarded in part last week by the World's Fair authorities in Chicago. The King Iron Bridge Company of Cleveland secured the iron work on the former for $34.600. The lowest bid on the carpentry work was that of Agnew & Co. of Chicago, whose price was $450,000. The staff work, or plaster coating on the outside of the manufactures building will alone cost $73,000, which is the bid of Smith & Crunk of Chicago.

Tin-Plate Nomenclature.

BY OBERLIN SMITH.

Pertinent to the very interesting discussion which has been running through the columns of *The Iron Age* in relation to the nomenclature of American tin plate, I wish to suggest that the present would be a good time to utterly do away with the whole set of abominable systems, or rather *un*-systems, which we have imported from Wales, and to start out afresh upon an American plan founded on common sense.

In regard to the number of sheets in a box: 100 or some multiple of it, preferably the former, seems to be the only sensible quantity for convenience of calculation.

In regard to length and width of sheets: There seems to be a necessity, in order to avoid waste, for a great many sizes, and these should undoubtedly be expressed as at present, in whole numbers of inches, avoiding fractions, the width first perhaps and then the length (this being the conventional order), as 10 x 10 inches, 10 x 14 inches, 11 x 13 inches, or any other measurement which the makers found the market required. There might very probably prove to be a demand for widths of any whole number of inches from 6 to 24 inclusive and for lengths of any whole number of inches from 10 to 40 inclusive —that is, for tin-plate packed in boxes.

It seems likely, however, that after a while the ingenuity of our American manufacturers and tool-makers will develop a system for making it in long rolls, just as sheet brass is made, by continuous processes of rolling, pickling, coating, cleaning, &c. The value of such rolls of metal would not only be great for roofing purposes, but more especially for operations to be performed in presses. Sheet metal in this shape can be fed automatically through a press from one reel to another, thus not only saving considerable stock that is now wasted at the ends of the sheets, but dispensing with a good deal of the time of an operator, who can attend to several machines at once; and, furthermore, allowing the machine to be run much faster than is possible by hand feeding.

In regard to thickness: The abominable and wholly ridiculous humbug of wire gauges should, of course, be dispensed with, as their numbers do not mean anything, are placed in reversed order from the quantities measured, and have no uniformity or co-relation among the different types of gauge. More absurd even than the use of these gauges is our present christening of "taggers" to denote a thickness of anywhere from 0.004 inch to 0.008 inch, averaging, perhaps, 0.006 inch; of "IC" to denote from 0.010 inch to 0.014 inch, averaging about 0.012 inch; of "IX" to denote from 0.013 inch to 0.017, averaging about 0.015 inch; of "IXX" to denote from 0.015 inch to 0.019 inch, averaging about 0.017 inch, &c. None of these terms have any definite value, and such values as they have overlap each other in many cases, as has just been instanced. Neither are there any gauges in existence wherewith to measure sheets designated by these mysterious symbols.

Still more foolish yet would it be to designate thickness by the weight per any unit of surface area, as so many pounds per square foot; for the computations necessary in solving such puzzles are entirely too troublesome, and do not give any definite idea of the thickness, without long practice.

Why the plain, common sense method of stating the thickness in thousandths of an inch should not be followed it is difficult to imagine, except by a proper conception of the intense stupidity and conservatism embodied in the old-time methods. Micrometers for measuring in this way are now plentiful, cheap and easily managed; and, moreover, gauges similar in appearance to ordinary wire gauges can easily be manufactured, which will be numbered in accordance with micrometer measurements; that is, each notch can be numbered by the number of thousandths of an inch which it represents. To clearly individualize such a future gauge, I will suggest that it be made of an elliptical contour—this being, I believe, a new shape for such tools, and one that would distinguish it at a glance from the old gauges, which are usually made either round or oblong

In the accompanying sketch is shown, to a scale of real size, a special micrometer of my own design—which, by the way, is not patented, and is hereby freely offered for public use. It is intended to have a deeper throat, T, than usual, so that it will measure as much as 2 inches from the edge of the sheet, and thereby avoid the thin places apt to occur near the margin; and it is small enough to go into one's waistcoat pocket. It may, for ordinary tin plate of all thicknesses, be graduated to have a range from 0.001 inch to 0.025 inch, inclusive, all coming within one turn of the screw S and, therefore, being much easier to read and understand than are the ordinary micrometer gauges. A special feature of this instrument is the prism-shaped reading pointer, P, up and down in front of which, and nearly touching it, the periphery of the screw head travels. If desired, the screw can be of coarser pitch, so as to cover various thicknesses of sheet brass, copper, zinc, &c., and yet never make more than one revolution, thus retaining the easy reading qualities mentioned, although crowding the figures closer together upon the screw head—that is, unless such head is made larger. This tool is supplied with the usual locked adjusting screw A, and with the locking screw L, by which the main screw S is secured in cases where it is desirable to test a number of sheets which are required to be of a fixed thickness. This machine can be very cheaply manufactured in quantities, and is just as use-

ful for measuring small wire as for sheet metals. It is earnestly to be hoped that our future common sense will induce us to use some measuring system of this kind, not only for the purposes mentioned, but for thread, paper, pasteboard, leather, glass and other substances whose thickness is now designated by the most roundabout and ridiculous methods.

In regard to thickness of coating: I have not quite made up my mind as to the best unit of measurement. At present writing, however, itseems to me that if the proportion or ratio of the total thickness of the tin or other coating to the iron or other plate was mentioned it would give a good idea of its composition. Thus if the total thickness was made up of $\frac{9}{10}$ iron and $\frac{1}{10}$ tin the "richness" of the article, so to speak, would be expressed by the fraction $\frac{1}{10}$.

In regard to the quality of the iron or steel, and also the material and quality of the coating· I have not settled in my mind upon an absolutely perfect system. Possibly, however, it would be a good scheme to designate the material of the original sheet by S for steel, I for iron, C for copper, &c., followed by a number for its quality, as 1 for best, 2 for second best, &c., these being printed in small figures, like exponents, after the letters and higher up. The coating might be known in the same way, as T for tin, L for lead, Z for zinc, and combinations of these letters for a mixture of metals, as T L, when tin and lead were used together, &c , the coating letters always to follow after the others. Thus galvanized iron, so-called, which is coated with zinc, could come under the same general system as tin plate, as could cop per coated with tin, iron or brass with nickel, &c. We would then have a universal system which would in most respects be not only scientific in its principle, but suggestive and easily remembered, on account of the initial letters used; while at the same time it would be so elastic as to permit its application to various conditions of the problem. The unscientific point about it would be in grading the quality of the iron or other plates as first, second, &c., because intermediate qualities might afterward be made by the same or other makers. I think, however, that it would do for a beginning, as the "quality exponent" might be omitted, modified or have a substitute (either a number, letter or other sign) at any future time without affecting the other symbols in the least.

According to this general plan some certain size and quality of tin plate might be expressed thus: 14 x 20 x .012 $\frac{1}{12}$ S^1 T. These symbols evidently mean a sheet of 14 x 20 I C steel tin plate, coated with pure tin to about one-twelfth of the total thickness of the steel, or about $\frac{1}{200}$ inch of tin on each side. The symbols, 10 x 14 x .015 $\frac{1}{20}$ I^2 TL, would mean 10 x 14 IX tin plate, made from second-quality sheet iron, coated with a mixture of tin and lead to a less thickness than in the former case. The symbols, 24 x 96 x .035 IZ, would mean galvanized sheet iron 24 inches wide by 8 feet long, No. 20 Birmingham guage, the I and Z, of course, standing for the iron and zinc respectively, but the quality of the iron and the thickness of coating being omitted; although they might, of course, have been inserted in their proper places, exactly as before, if anybody cared to know the kind of iron or thickness of zinc. The symbols, 6 x 1200 x .016 C^1, would mean a roll of first-quality sheet copper 6 inches wide, 100 feet long, and of a thickness measured by a No. 26 B. & S. wire gauge. In this case there is no coating and, therefore, the symbols for this material and its thickness are omitted. In the case of alloys, as when a coating is made of tin and lead mixed, the proportionate amount of each metal could, when necessary, be expressed by using a "sub-number" after each letter, thus: T_1L_2—the meaning here being that its proportion is one of tin to two of lead. Such refinement of expression could, however, in many cases be omitted.

It would be more systematic, in the examples previously given, to put the length first and then the width, thus making a logical and gradual decrease from the largest dimension, the length, to the smallest measurement of all, the thickness. This, however, would make ordinary tin plate read "20 x 14" instead of "14 x 20," which, perhaps, the dealers could not get used to. The other regular order that here occurs to one, to put the thickness (which is the smallest dimension) first, is objectionable, on account of a decimal fraction not being a good thing to commence a sentence with. Instead of putting the letter x between the different dimensions it might be better to put simply hyphens, and to put them also between the other symbols. Carrying out this idea, and also the one above mentioned of stating the length first, a sheet of IC coke tin plate might very likely be expressed thus: 14-10-.012-$\frac{1}{12}$-I^2-T.

It will be seen by the above examples that some system of this kind can be made very elastic, for various kinds of materials, and for various amounts of information concerning them; and, furthermore, that such information can be definitely and uniformly expressed in a very much shorter way than by the old methods—and that without any Welsh spelling of long words having no definite value. To recapitulate: The three dimensions of the piece of material to be described are in all cases stated in inches and thousandths thereof. The thickness of the coating, if there be any, is stated as a ratio of the whole thickness. The material of the plate is stated by the initial of the name of the metal of which it is made. Its quality is stated by its grade number, written exponent fashion, in such cases as an arrangement can be made for grading it. The metal or metals of which the coating is composed are also stated, as in the case of the plate, by initial letters (following the plate initials) and the relative proportions thereof by attached sub-numbers.

I do not offer the above as a perfected system, for a committee of experts (if they had systematic minds) might very likely much further improve the details, while using the same general principle, which obviously is a correct one.

A Fine Furnace Plant.

The two large coke iron furnaces of 150 tons daily capacity, erected at Middlesborough, Ky., by the Watts Iron and Steel Syndicate Limited, under the management of John L. Reis (with the exception of the setting up of some of the engines), are now fully completed and will be ready for operation by July 1. The plant is first class in every respect, embracing all modern appliances. The cast houses are of extra capacity, and in addition to them is a third cast house, being made by inclosing and covering the space ordinarily left between the two cast houses, giving a breath of 180 feet, thus affording ample opportunity for the iron to cool in the pig bed and not injured by chilling, caused by wetting down too soon, as is more often the rule than the exception with Southern furnaces. These furnaces may be delayed from going into blast as soon as expected if the English board of directors decide to adopt plans submitted, whereby the molten metal will be conveyed direct from the furnaces to the steel plant, and not run into pigs. This will necessitate more improvements and building. The contract for the erection of the basic open-hearth plant, itself, was $800,000, to be finished by next January. There are several hundred men pushing it forward. The main building for the smelting furnaces is nearly all up, is 600 feet long, and the blooming mill building is 250 feet long—all of iron, stone and brick. There will be seven melting furnaces to commence with, with a capacity of some 125 tons per day. The work is all of the most solid and substantial character, and the plant will not cost less than $1,000,000 when completed. This syndicate is also erecting substantial brick machine shops and foundry for their own use. There are 300 coke ovens already fired at Muigo Mountain, some five miles from Middlesborough, which are turning out a good quality of furnace coke, and several thousand tons of superior quality of ore is mined near Cumberland Tap, ready to be transported to these furnaces. A branch of the Louisville and Nashville Railroad will in a few weeks be completed, which will connect with the Norfolk and Western Railroad in the Flat Top coke fields, thus giving Middlesborough and Big Stone Top the benefit of cheap and excellent coke from the Pocahontas district at a freight rate of probably not to exceed $1.50 per ton.

New Freight Rates.

The Queen and Crescent route has issued Tariff No. 29, effective June 10. The rates on carload lotes per ton of 2268 pounds to some of the leading points are as follows:

To	From Chattanooga, Tenn.	From Birmingham, Ala.	From Florence and Sheffield, Ala.	From Anniston, Ala. (via Attalla).
Akron, Ohio	$3.35	$3.85	$3.60	$3.85
Atchison, Kan	5.00	5.00	. .	5.00
Chicago, Ill.	3.60	3.85	3.60	3.85
Cincinnati, Ohio	2.25	2.75	2.50	2.75
Cleveland, Ohio	3.35	3.85	3 60	3.85
Columbus, Ohio	2 85	3.35	3.10	3.35
Detroit, Mich	3.60	3.85	3.60	3.85
East St. Louis, Ill.	3 00	3.25	.....	3.25
Fort Wayne, Ind.	3.35	3.60	3 35	3.60
Kansas City, Mo	5.00	5.00	.....	5.00
Louisville, Ky	2.25	2.50	2.25	2.50
Memphis, Tenn	2.00	2.00	.....	.....
Milwaukee, Wis	4.00	4.25	4.00	4.25
Omaha, Neb	5.84	5.84	....	5.84
Pittsburgh, Pa.	3.90	4.40	4.15	4.40
Springfield, Ill	3.65	3 90	3.65	3.90
Steubenville, Ohio	3.90	4.40	4.15	4.40
St. Louis, Mo	3.00	3 25	.....	3.25
Terre Haute, Ind	3.00	3.25	3.00	3.25
Wheeling, W. Va.	3.90	4.40	4.15	4.40

Steel is gaining ground in car construction. A committee of the Master Car Builders' Association has reported that there is now about 15,000 tons of pressed steel on cars in the United States. Pressed steel center plates are in use on 25,000 cars. Pressed steel freight trucks are being gradually introduced, the weight being somewhat less than the diamond truck for 30-ton cars, while they are furnished at the same cost.

The president of a sugar company at Lake Charles, La., recently wrote to the Treasury Department in regard to the free entry of certain machinery for crystalization of second sugar in motion and to make granulated sugar direct from the centrifugals, and asking whether such machinery would be liable to duty if imported for experimental purposes. Assistant Secretary Spaulding has answered him in the affirmative.

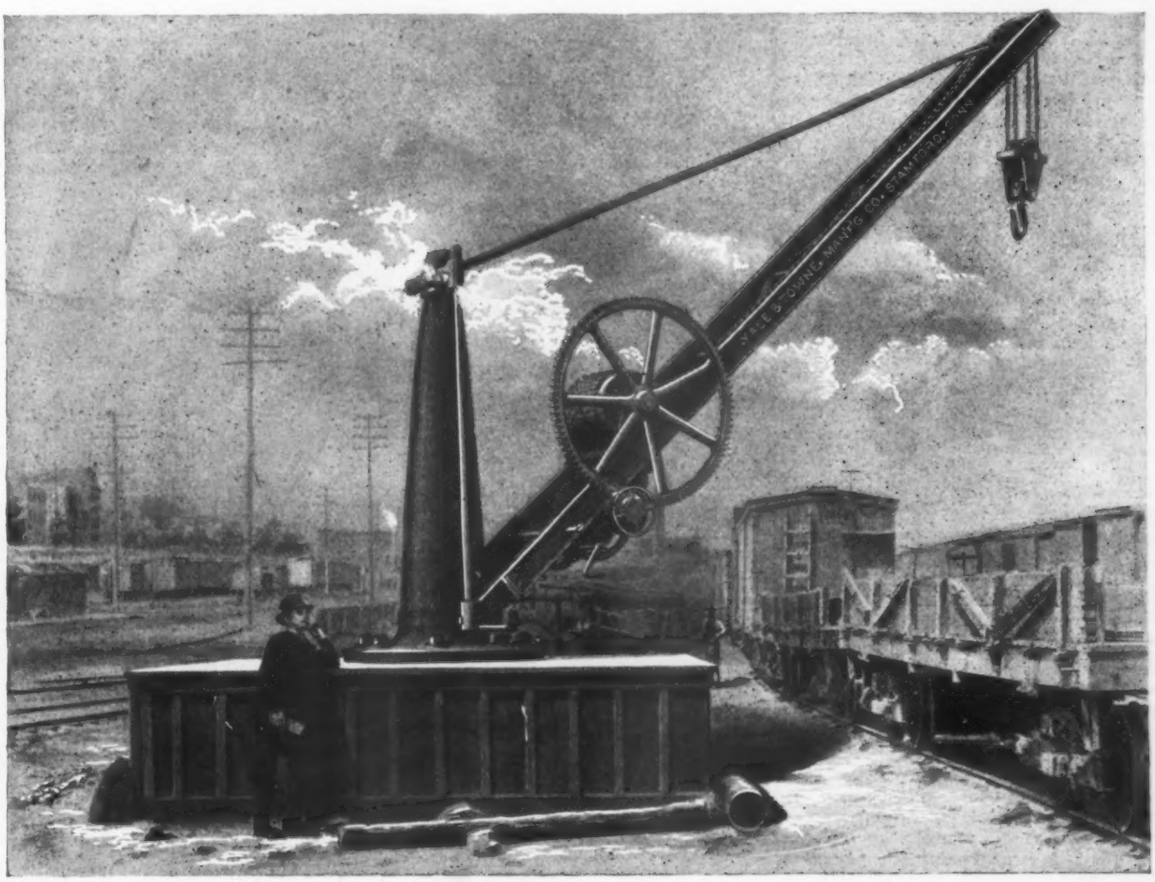
Pillar Cranes.

The pillar crane which is shown in the engraving is one designed by the Yale & Towne Mfg. Company for the North Carolina Railroad at Baltimore, Md., and may be taken as a general example of the pillar cranes made by that company. The crane consists of a heavy cast-iron pillar with broad base, designed in a form to oppose a uniform resistance to the stresses upon it and mounted upon a foundation of depth and area proportioned to its capacity. The pillar is firmly anchored to the foundation by heavy bolts extending through to a foundation ring upon which the masonry is built, and in this way stability for the heaviest loads is obtained.

The moving parts are all suspended to the top of the pillar upon a yoke or crosshead which is carried upon a steel pin forced into the top of the pillar and fitting into a suitable bearing in the crosshead. Here ample provision is made for lubricating and to receive wear. The boom, from the outer end of which the load is suspended, is formed of a pair of rolled channel bars latticed together, and its vertical pressure is carried entirely by two hanger rods connected to the crosshead. The horizontal thrust of the boom is received by thrust rollers which travel upon a bearing surface around the base of the pillar, while the outer end of the boom is connected to the crosshead by two tie rods.

The winch by which the hoisting is performed contains many valuable features. The chain after having passed about the blocks is wound on a grooved drum of large diameter, motion being given to the drum by a train of spur gearing operated by the hand cranks. Two changes of speed are obtained without shifting cranks. The large diameter of the drum reduces the bending and wear of the chain to a minimum and the direct train of spur gearing enables a high degree of efficiency to be secured.

The construction of the winch is such as to secure the greatest safety and facility in handling light or heavy loads. Lowering is effected by turning the cranks backward, the load being at all times sustained by the action of the Weston safety pinion, and the rapidity of the descent is under control at all times. When the motion of the handles is stopped the lowering ceases, and should the handles be suddenly let go their motion will stop at once, as it is impossible for them to fly back. The value of this safety feature will be appreciated, as it removes entirely all danger to employees or to merchandise from loss of control of cranks or brake. When the empty chain or light loads are to be lowered rapidly the Despatch lowering device may be used. This is operated by the hand wheel shown just beneath the large spur gear wheel in the illustration, and by its use the load may be permitted to run down at any desired speed, remaining at all times under the entire control of the operator. Under these circumstances the hand cranks and gear train remain at rest, the drum gear and pinion only being in motion, and dispatch lowering is thus safely and readily accomplished. Special care is given to the manufacture of the chain which is used on all cranes of this company, all chain being made and tested most thoroughly at the works.



PILLAR CRANE, BUILT BY YALE & TOWNE MFG. CO.

There is very little to be said about business in San Francisco. It has in all lines been dull and iron and hardware have been no exception. The reason of the dullness is not very well understood—every one has his theory, but none of those propounded seem to be entirely satisfactory, but the outlook is of the very best. The grain crops are looking better than ever, the fruit crop will be good, prices are good, everything looks well, and there is little doubt that all the dullness of the early part of the year will be amply atoned for later on. There has been little or no change in prices.

South American Trade.

A report apropos to the present discussion of our trade relations with South America is in course of preparation by the Bureau of Statistics of the Treasury Department. A statement showing the aggregate commerce of the Southern countries suggests some interesting comparisons with the commerce of this country. The commerce of the countries south of us, including the West Indies, and including the statistics of imports and exports of both merchandise and coin and bullion, was $1,143,139,879 for the latest years for which returns have been received. These figures, in most cases those of 1889, show an increase since 1870 of $249,401,305, or 60.43 per cent. Mexico shows an increase in 19 years of $11,879,145, or 19 per cent.; Central America, $10,965,502, or 45.5 per cent.; the British West Indies, $13,486,215, or 28 per cent.; other West Indies, $63,617,145, or 33.65 per cent., and South America, $342,939,513, or 78.6 per cent. Even the United States, with her rapidly expanding trade, has not quite kept pace with South America in the percentage of increase of her commerce. The aggregate figures are greater, however, than for our Southern neighbors. The total value of our imports and exports for 1890 was $1,597,628,312, while the commerce of South America for the years given was $1,143,139,879. This shows a

margin in our favor of $454,488,433, but the rate of increase since 1870 has been only 74.07 per cent., while that of South America has been 78.6 per cent.

When the young republics of the South come to compare themselves with the countries of Europe they have even greater cause for congratulation in the increase of the volume of their trade. The commerce of Great Britain increased from $2,663,620,718 in 1870 to $3,616,930,121 in 1889, an increase of 35.79 per cent. The commerce of Germany advanced from $1,853,113,934 in 1872 to $2,433,208,470 in 1889, or 31.3 per cent. The commerce of France rose from $1,353,587,776 in 1870 to $1,953,890,420 in 1889, or 29.6 per cent. The growth of the trade of none of these countries compares with that of South America. The greatest increase among the Southern countries has been in the Argentine Republic, Brazil and Chili. The increase for 19 years in the Argentine Republic was $152,409,272, or 223.75 per cent.; in Brazil, which has the largest volume of trade of the South American countries, the increase was $65,002,976, or 33.58 per cent.; in Chili the increase was $52,265,409, or 77.7 per cent.; in Uruguay the increase was $37,126,653, or 131.83 per cent.

The following table shows the volume of our export trade in leading articles with the grand divisions of the Southern world for 1890:

Articles.	Mexico and Central America.	West Indies.	South America.
Agricultural implements	$65,193	$139,418	$1,463,369
Wheat flour	962,610	5,468,314	5,300,273
Other breadstuff	728,211	1,718,706	2,819,854
Cotton, unmanufactured	1,236,220	.....	.....
Cotton cloths	926,652	1,156,742	2,562,959
Cotton, all other	253,197	102,772	136,553
Iron and steel	3,846,263	3,450,521	5,071,434
Mineral oils	346,163	629,098	2,541,988
Provisions	864,355	6,908,324	4,227,645
Boards	486,258	1,337,748	2,848,391
Other wood	1,182,954	2,012,763	1,500,513
All other articles	7,230,871	9,259,285	9,272,023
Totals	$18,118,947	$32,183,671	$37,745,002

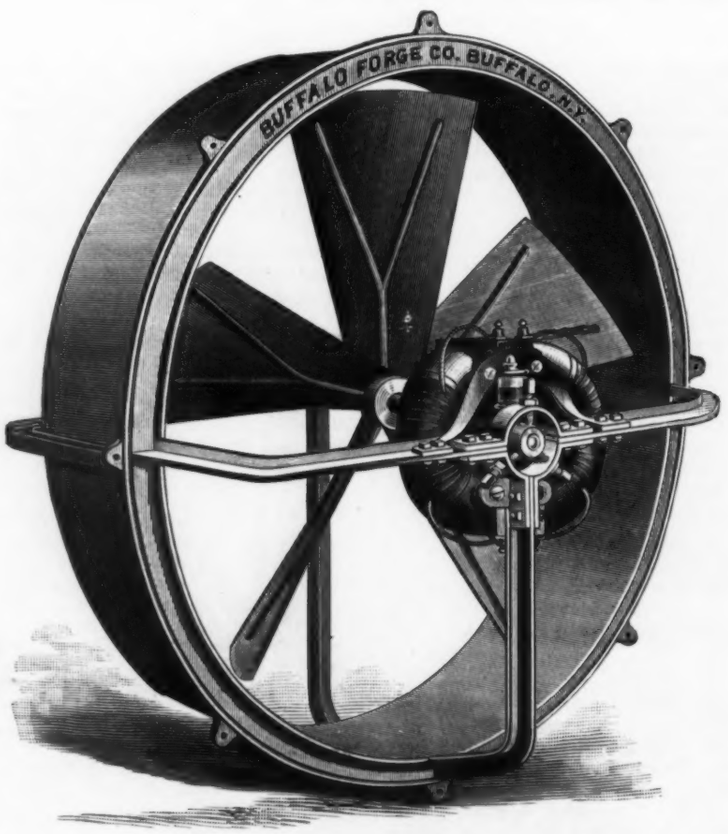
The Parcels Post.

The use of the system of parcels post seems to be rapidly extending among merchants who deal with the countries with which we have parcel post conventions. The advantages of the system are not very widely known, but as the knowledge of them extends the business of the Post Office Department increases and our trade with the parcel post countries expands. The chief peculiarities of the system are the large size of the packages which can be sent, the fact that dutiable merchandise may be sent subject to duty without confiscation, and the security of the parcels by means of receipts given at the mailing office. The matter subject to parcels post is all merchandise which is not forbidden transmission through the mails, and the charge is only 12 cents per pound or fraction of a pound. This is less than the rates of merchandise postage in the United States, but there is an additional charge of 5 cents, which is collected on each parcel when delivered, and 1 cent additional for each 4 ounces in excess of 1 pound. The dimensions of parcels post packages are 2 feet for the greatest length and 4 feet for the greatest girth to Mexico, and 3 feet 6 inches for the greatest length and 6 feet for length and girth combined to other countries with which we have conventions. The maximum weight for all countries is 11 pounds.

The regulations regarding the collection of duties are simple, and can be easily learned at the post offices. It is necessary to carry parcel post packages to the mailing post office in any event, in order to obtain a certificate of mailing. A return receipt may be obtained by the payment of an extra fee of 5 cents in the case of packages for Jamaica, Barbadoes, the Bahama Islands and British Honduras, but the certificate of mailing is given without extra charge for packages to all parcels post countries. Packages under this system can also be registered for 10 cents under the regular registry system, and in this case there is no extra charge for the return receipt. Packages are required to bear the words "Parcels Post" in the upper left-hand corner, and the name and address of the sender. Letters are not allowed to be included in parcels of this sort, nor interior parcels intended for delivery at an address other than that borne by the parcel itself. It is obvious that the small charge and the considerable magnitude allowed for packages make the parcels post system a cheap and convenient one for sending a good many articles of merchandise to foreign countries.

Buffalo Electric Disk Wheel.

The rapid gain in popularity of electricity as a motive power is continually making the convenience of electric ventilating fans better appreciated. The accompanying engraving illustrates the improved electric ventilating wheel just perfected and placed on the market by the Buffalo Forge Company, Buffalo, N. Y. As clearly shown, the motors are built as a part of the fan, and require only minimum power for driving. To start is merely a matter of adjusting a switch or pushing a button, neither engine nor belt being required; either operation is unattended with danger. For ventilating purposes in structures of any decription, these fans constitute an effective and desirable system. It will be seen that the important question of proper ventilation can be effectually provided for, even in locations where boiler or engine could not be placed. Usually the electric current to drive these fans may be obtained from the street wires of the electric light companies at moderate cost. Any position suited to the maximum efficiency of a fan may be employed without affecting the arrangement of the motor. The fans are of usual standard high grade, carefully balanced, and the entire outfit designed for quiet running at high speed. The motors are of the most approved style and type, especially constructed for fan propulsion, and capable of continuous use with little attention. The high speed at which it is possible to run these wheels gives them large capacity, so that a smaller fan occupying little space can be used to ventilate apartments of considerable size. In dynamo rooms of electric light plants electric fans are naturally preferred to any other means of ventilation, and for various ventilating uses on ships they are also particularly suited.



THE BUFFALO ELECTRIC DISK WHEEL.

B. F. Jennings of Jennings, Beal & Co. of Leechburg, Pa., says that the demand for soft pickled steel is rapidly growing in this country. It is not generally known, but to-day from 3000 to 5000 tons of light sheet steel are consumed in the manufacture of frying pans alone. Formerly a frying pan weighed many pounds, for it was made of iron. To-day by the use of steel plates a "spider" takes the place of the heavy skillet. They have a contract for 700 tons of pickled steel for manufacture into light frying pans. The Leechburg Steel Mill is also supplying the steel plates to the Buffalo Stamping Works, where it is coated with tin and sold at a profit.

There is supposed to be a good prospect that work on the proposed bridge between New York and New Jersey will begin early in September, now that the two companies interested are consolidated under the executive control of Andrew H. Green. A bill confirmatory of the charters granted by the States of New York and New Jersey will be introduced in Congress in December.

THE WEEK.

The California fruit crop this season will be large, and Delaware is sure of a large peach harvest. Arrangements have been made to combine three of the largest prune ranches of California and form a stock company, with a capital stock at $500,000, to make a decided fight for the American market for American fruit.

Armour, the Chicago pork packer who is starting works in Indiana to rival the English syndicate now owning the stock-yards, writes from Stuttgart, vindicating the German laws excluding American pork, and at the same time expresses confidence that the Government will remove restrictions as soon as inspection of pork products is properly enforced in the United States.

Secretary Foster will recommend to Congress again next December new legislation to enable the Bureau of Statistics to obtain accurate returns of our export trade by rail. Secretary Windom set the matter forth concisely in the following paragraph of his annual report for 1889: "The governments of Canada and Mexico obtain and publish statistics of the exports of those countries by railway, and appear to encounter no special difficulty in so doing. What is possible and desirable for them is equally possible and desirable for us. Any statute passed upon the subject should contain a penalty for failure of the carrier to make a return of exportations in such form as may be prescribed by regulation." The need of legislation grows more marked every year as the volume of exports over the Canadian railways into Canada and over the Mexican Central Railway into Mexico increases.

It is thought that the real reason why Emin Pasha did not wish to be "rescued" by Stanley is discovered in the fact that since his return to inner Africa he has sent nearly $500,000 worth of ivory to the coast.

Consul Brown, at Glasgow, shows how the exportation of American flour has been discouraged by the delay in transportation and the irresponsibility of steamship companies. Shipments are carried frequently to the wrong port, and the consul cites cases where flour, from interior ports in this country, has been 200 days in passage to Europe. As the flour is sold at 60 days after sight of the bill of lading, it is evident that such a slovenly way of doing business on the part of the transportation companies is highly disadvantageous.

Newfoundland has about 200,000 inhabitants, most of whom subsist on the fisheries, and their export trade amounts to about $6,000,000 per annum. Of the imports the United States furnish about one quarter, principally provisions and groceries. The entire country is about the size of New England.

The annual report of M. de Lesseps, president of the Suez Canal Company, just issued, shows that last year's receipts amounted to 70,460,910 francs, while the expenses of every sort only aggregated 32,327,526 francs. During the 12 months 3389 vessels passed through the canal, yielding an income of 65,427,230 francs. The passengers on board numbered 161,353, which swelled the receipts by 1,613,538 francs. The net dividend, including interest, is 86 francs 75 centimes and it would have been 87 francs 31 centimes but for the recent increase in the French tax from 3 to 4 per cent.

Ireland's population is shown to be less than 5,000,000.

It is an ignoble fate for the great canal digger, M. de Lesseps, that he should be put on trial for misleading investors.

The steamship Majestic made over 500 miles a day for four days in succession, and came near making the fastest trip on record.

In connection with South American trade there is a succession of unfortunate occurrences. Closely following the bankruptcy of Goff's export company and the death of the projector comes the announcement that Jules Merzberger, lately in the management of the South American branch of the business of the New York Life Insurance Company, stole large sums from the company's funds in the possession of the agency, $370,000.

Bank Examiner Drew has been suspended from duty pending the result of an investigation into his administration, and has been instructed to examine no more banks in his district for the present. Philadelphia complains that although the Keystone Bank, which had on deposit $441,000 of the city's money, has been for three months in the immediate charge of Examiner Drew, no authenticated balance sheet of accounts has been furnished.

President Miller of the Nicaragua Canal wants California to aid in that enterprise. He says that if California were to build the canal alone at an expense of $10,000,000 annually until its completion it would find the investment a profitable one.

Italian immigration has suddenly fallen off, owing to the enforcement of the new laws.

United States Commissioner Shields decides that mail matter placed on top of a mail box has not been mailed and is, therefore, no more secure from theft than if left in the street.

The Attorney-General has secured leave from Judge Andrews of the Supreme Court to begin an action against the Celluloid Brush Company and the Celluloid Novelty Company to have their charters forfeited because they have become members of the Celluloid Trust known as the Celluloid Company of New Jersey. This company was incorporated with a capital of $6,000,000. Other companies in the trust are the Celluloid Manufacturing Company, American Zylonite Company, United Zylonite Company and the Lithoid Company.

The Canadian Pacific Railway Company have secured terminal facilities in Seattle for the Oregon Improvement Company, and will put on two steamers between that city and Whatcom, connecting at the latter point with the New Westminster Railroad, an extension of the Canadian Pacific.

The public debt of Brazil has quadrupled in the last six years.

The total assessed valuation of Boston is $100,000,000, an increase of $25,500,000 over the previous year. The rate of taxation will be $13.30 per $1000.

The Census Office statistics of petroleum production, prepared by Joseph D. Weeks, special agent, show that in 1889 the total production was 34,820,306 barrels, valued at $26,544,052. Nearly the entire amount produced in California, Indiana and Ohio was used for fuel, while nearly the entire amount produced in Colorado, New York, Pennsylvania and West Virginia was used for illuminating purposes.

High prices for wheat in India have stimulated an export movement of the first magnitude, which is already having a positive effect on the English market. The Bombay *Times* of a recent issue says: "Never since 1874, the year when the wheat trade practically began, have the receipts of wheat in Bombay been so large, or nearly so large, as in the first four months of the current year—that is, from January 1 to April 30. They have reached during that period the enormous total of 198,097 tons, as compared with 97,420 in the corresponding four months of the previous year, 178,686 in the same period of 1886, in which year the shipments were larger than had ever before been known. The increase is owing to railway extensions.

Recent heavy rains in Minnesota and the Dakotas have been so beneficial that there is now no doubt that the average yield will be higher than that of last year, as also will be the total product.

Russian finances seem to be in a very poor condition. The budget of 1890 amounted to $540,000,000, of which interest on the public debt absorbed $150,000,000, and the defenses nearly as large a sum.

St. Louis expenditures during the past year were $8,550,000, while its receipts, including a balance of $3,075,000, were $10,835,000, thus reducing the balance to $2,280,000. For the coming fiscal year the interest on the public debt is $1,250,000.

None of the designs for the new silver coins were accepted.

The annual statement of the Chinese Maritime Customs shows while imports increased during the year 1890 compared with 1889 the exports of tea and silk declined, the former on account of the increased competition of India and Ceylon, added to the influence of the rapid rise of the gold value of silver, which retarded purchases. Imports of cotton goods show an extraordinary increase, equal to 25 per cent.; cotton yarn from India poured into China in greater quantities than in any previous year, and the success of the mills in China in turning Chinese cotton into yarn is also a subject of congratulation. The total of entries and clearances was 24,876,000 tons, of which 16,000,000 tons were under the British flag, six and one-third million Chinese, and one and one-third million German.

The Southern Pacific Railroad Company will import 5000 Japanese laborers for tunnel work, unless opposed by the general Government.

G. C. Wright, formerly resident director of the Nicaragua Canal Company, charges its management with gross extravagance, and urges the election of a new board of directors in order to save the enterprise from financial ruin.

The striking ore handlers in Cleveland, Ohio, have decided to resume work pending arbitration at Ashtabula. A compromise has been agreed upon, and the men will resume work at 9½ cents a ton—half a cent less than the men asked.

Labor unions oppose the continued existence of the New York State Board of Arbitaration.

Brazil is promised a coffee crop so large that Brazilian exchange has risen 20 per cent.

The National Cordage Company are said to have purchased every cordage mill in Canada for $2,000,000.

A large sum of public money, at least $1,700,000, has unaccountably disappeared through the operations of ex-city treasurer John Bardsley of Philadelphia, and he is urged by all considerations to make a complete confession. The Mayor and prominent citizens call for a complete exposure of the speculations that have ended so disastrously.

The estimated expenditure of New York City for the coming year is $13,500,000, an increase of nearly $2,500,000 over 1891. Included is $1,500,000 interest on the city debt.

The Iron Age

New York, Thursday, June 18, 1891.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Financial Outlook.

Now that the outward flow of gold has apparently ceased, business men have begun to look with apprehension to the time when the Eastern financial centers are heavily drawn upon for money to move the crops. Tight money in the fall is the contingency which many merchants profess to be preparing for with anxiety. Large concerns in the iron trade, for instance, avow their determination to sell to no one of their customers whose financial strength is not above all suspicion. Competition is so sharp and the possibility of profit so small that it does not pay to add to the ordinary risks those which tight money involves. That feeling is quite general in financial and trading circles. Whether it be justified or not, it must unquestionably have its great influence upon the volume of business transacted until the time of the alleged danger has passed, or until the conviction has gained ground that there is no occasion for alarm. One circumstance which tends to make this period of suspended animation more marked is the waiting for final information concerning the gathering of the crops.

Those who profess to be anxious about the future urge that while we have borne admirably the financial strain of the past six months, we have been weakened considerably, so that we cannot as well resist additional tension. Even if this conclusion be accepted, there are grounds for the belief that we shall be fully able to take care of ourselves during the short period which may precede the era of great prosperity promised by abundant crops and the acquired prestige of the last six months.

Taking the country as a whole new enterprises have been very much restricted since November last. There is therefore relatively little capital engaged in undertakings partly carried out, making the money therefore wholly unproductive. The lines have been very closely drawn, and credit has been restricted so that there is not an army of borrowers whom the slightest financial flurry plunges into difficulties. The weak have long been pushed into a position of safety to the community, while those who are strong are sound beyond the effects of any temporary stringency. Speculation in securities has been on a very moderate scale, so that there is not a large aggregate of money locked up in carrying lines of stocks. Business men throughout the country have been prudent buyers for a long time, manufacturers have been forced to produce on a moderate scale and have not accumulated unwieldy stocks, and importers have, with few exceptions, worked off the larger part of the goods which they bought so liberally in anticipation of higher duties during the last summer and fall. All this points to the probability of an ample supply of money to carry what business is to be transacted during the brief interval between the time of moving the crops and the time when foreign consumers send back gold to pay for that part of our surplus cereals which they must have. Another consideration, to which we have already alluded in the past, is that the increase in wealth in the West has been so great during the past few years that, relatively speaking, the amount of money called for from the East to move crops has much diminished.

Finally, one idea is finding more general acceptance with business men throughout the country, and that is that the fear of tight money in the fall and the measures taken widely to prepare for it will do much toward avoiding the happening of the very thing which all expect.

World's Fair Progress.

The awarding of contracts in quick succession for the erection of World's Fair buildings at Chicago is one of the best evidences that the work of preparation is being actively pushed. It is not at all remarkable that evidence of this convincing character has been needed to satisfy the outside world that the exposition is an assured fact. Over and over again the project has seemed to be in danger of proving a fiasco, in consequence of the apparently interminable differences of opinion arising among the managers over all sorts of questions. The attempt to use the World's Fair scheme as a lever to force the settlement of disputed land claims on the lake front, which have long been in controversy between the city and the Illinois Central Railroad Company, was a perilous experiment, and it is well that the failure of the attempt did not carry the Fair with it. Then the rivalry between the residents of the different sections of the city for the selection of a site in their immediate vicinity was carried to such a pitch as to engender considerable bitterness, involving the not unreasonable supposition that the disappointed contestants would give the Fair but half-hearted support, going even to the extent of refusing to pay promised subscriptions to the stock of the company. But all these troubles have been overcome, and there is to-day complete acquiescence in the decision as to the site, while all classes of citizens, without regard to party or section, are earnestly doing all in their power to make the exposition of 1893 a complete success.

The financing of the undertaking has for some time lost the prominence which was given it in the early days of the World's Fair agitation. Confidence is felt that all the funds needed will be forthcoming as the work of preparing the grounds and buildings progresses. The municipality and the citizens individually now have too much at stake to permit a hitch to arise at any stage of the proceedings for lack of funds. So confident of the success of the enterprise have the managers become that they are enlarging their plans instead of reducing them, believing that additional funds can be raised for the purpose. The machinery has been put in motion for the collection of at least $2,500,000 from citizens of Chicago who have not yet subscribed for World's Fair stock, among whom are a number of prominent and wealthy business men. The money thus secured goes to the erection of the principal buildings and the ornamentation of the grounds, and will far exceed the amount expended for any previous international exposition. In addition to this, however, appropriations are being made by the legislatures of most of the States for special representation at the fair. These are much larger, as a rule, than those made for the same purpose at the Centennial Exposition in Philadelphia. Outside of Pennsylvania, appropriations were made at that time for $268,500. Outside of Illinois, up to the present time, State appropriations have been made for the Columbian Exposition aggregating $1,775,000.

The United States Government spent $649,250 at Philadelphia and loaned $1,500,000, which was repaid, but it has voted to expend $1,500,000 on its exhibit at Chicago. These facts tend to show that the National Government and the States appreciate that the World's Fair of 1893 will be a far greater exposition in every way than the Centennial.

Appropriations for special State representation have been defeated by the legislature of Arkansas, Kansas, New York, Oregon, Rhode Island, South Dakota and Texas, while action has not yet been taken by Alabama, Delaware, Georgia, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Nevada, South Carolina, Tennessee, and Virginia. These States appropriated an aggregate of $123,600 for Philadelphia. In some of them the citizens have inaugurated a movement for a State representation to be supported by a fund raised from private subscriptions. Texas, Kansas, Arkansas and South Dakota promise in this way to raise a larger amount than their legislatures were expected to appropriate. The great State of New York is altogether too prominent among the laggards, and her citizens should show that they are not less public-spirited than the people of Texas, Kansas, Arkansas and South Dakota, who propose to make up so handsomely for the shortcomings of their legislatures.

Abroad, the work of the Columbian Exposition is steadily proceeding. The exposition managers report that official acceptance of the President's invitation to participate in the World's Columbian Exposition at Chicago has been received from the following foreign governments: France, Great Britain, Germany, Spain, Japan, China, Mexico, Peru, Honduras, Salvador, Costa Rica, Colum-

bia, Cuba, Guatemala and Jamaica. Unofficial assurance of acceptance has come from Egypt, Morocco, Nicaragua, Venezuela, Ecuador, Brazil, San Domingo, Hayti and British Columbia. It is reliably reported that the British Colonies in the West Indies, and South and Central America, including British Honduras, British Guiana, Jamaica, Trinidad, Barbados, and other islands, will unite in the erection of a "West Indian Court"—a building typical of tropical architecture, and filled with tropical exhibits of most varied and interesting description. In addition to the information given above, reports have been received at exposition headquarters that great interest concerning the exposition is felt in Austria-Hungary, Belgium, Holland, Norway and Sweden, Russia, India and other countries, and that their participation is almost a certainty. Many of the foreign nations will erect buildings of their own. But few particulars have been yet received concerning the amounts which foreign nations will expend on their exhibits, but the probability is that they will be larger than for any previous world's fair.

Special Treasury Agents.

Special Treasury Agents were never popular among importers. Their work is necessarily in some respects inquisitorial, and in the absence of definite instructions, in special cases, must often appear arbitrary. Importers have sometimes had their places of business closed in a summary manner, and it is possible that in certain instances suspicions of wrong doing have not been confirmed by subsequent investigations. And still there is at times abundant evidence of undervaluation, to the detriment of the public revenue and to rival merchants in the same line of trade. The least that can be said is that while the employment of special agents by the Treasury may be unavoidable, the service performed is often extremely difficult and delicate, these agents being invested with large discretionary powers, and errors of judgment are liable to entail serious consequences. In reply to a recent communication from a committee of the New York Chamber of Commerce, Secretary Foster says, respecting the functions of the Special Treasury Agent: "They exercise no authority over Collectors of Customs, but it is their duty to advise with and instruct all customs officials whenever necessary. They are required to bring to the notice of the local customs officials such frauds, abuses, irregularities or other defects as they may discover, and do not interfere with the regular transaction of customs business by collectors and other local officers. * * *

For a number of years past the special agents have successfully combatted the most skillfully concocted schemes of foreign shippers and their agents in this country, who appear to regard it as justifiable to evade our revenue laws, and in the performance of this duty they would seem to be entitled to the support of all honest men engaged in the importing business. I have had sufficient evidence of the results of the work of these officers submitted to me since I entered upon my official duties here to justify the opinion that they are invaluable auxiliaries in the efficient administration of the custom laws. Several of my predecessors have testified their appreciation of the services of these officers by assigning them to important and delicate duties, requiring the exercise of sound discretion, integrity and exceptional ability, and in a number of instances, by reason of the capacity shown, they have been advanced to positions among the most important in this department. They are not detectives in the sense in which that term is ordinarily used, as is sometimes assumed, but are employed upon the same class of inspection duty as are similar officers in other branches of the Government. All railways and other great corporations find it necessary to have skilled and able men to inspect the details of the work of their employees, in order to correct abuses and secure faithful and efficient service, and it is this class of work upon which the special agents are chiefly employed in the customs establishment."

During the last five years over $2,000,000 have been paid into the Treasury as the result of the work of special agents. It would be strange if, in the exercise of such a system, abuses are not sometimes practiced. The "system of moieties" in former years was the occasion of bitter controversy, and gave rise to investigations not always creditable to the parties concerned. In fact, flagrant instances of official misconduct were disclosed, and it was seen that merchants were not wholly incapable of corrupt bargains, in hopes of evading just penalties, which they had incurred. If the necessity for the employment of these agents is admitted, despite doubts to the contrary expressed by the New York Chamber of Commerce, the fact is immediately obvious that men appointed to these positions should be above reproach, who are actuated by no other motive than a desire to enforce the laws, intelligently and impartially, in order to secure their highest efficiency.

There is need of trustworthy information concerning the financial condition in Brazil. The best authorities quoted heretofore persist in affirming that the situation is "exceptionally sound and easy," a statement clearly at variance with well-know facts. The latest mail advices respecting the import trade are significant. On May 8 a meeting of merchants was held at Bahia, at which it was resolved not to withdraw goods from the custom house after the 15th of that month, because of a depreciated currency rendering impossible the payment of duties in gold. This resolution was signed by 197 importers, and followed by a petition for relief of some sort from Congress; other cities also being asked to join in protest. Shortly afterward the Brazilian Government rescinded the order and allowed customs to be entirely paid in paper currency, but at the same time increased existing duties 5 per cent. As many Americans are turning their attention to Brazil, to take advantage of improved trade relations, reliable data are in demand.

We announced last week the placing of a contract with a well-known Pittsburgh firm of manufacturers of rolling-mill machinery for a plant for Brazil. While this transaction will hardly be regarded as the forerunner of a more extensive business, since South Americans are not likely to become great iron masters in the near future, yet it is very significant, because it proves that foreigners are beginning to appreciate our pre-eminence in this class of work. American builders of railroad rolling stock, street cars, mining machinery, and special tools have long controlled the markets in many countries, because of their excellence and the fact that they are best designed for their work. The contract just placed for rolling-mill machinery proves that we can claim to lead in progress in that department also.

OBITUARY.

Moses A. Herrick, recently treasurer and Boston representative of the Nashua Steel and Iron Company, died at his home in Winchester on Wednesday morning. Mr. Herrick was born near Nashua, N. H., 69 years ago, and there resided until he removed to Winchester about 1868. While at Nashua he was connected with the Nashua Mfg. Company and the Jackson Company.

Nicholas Lebel, the inventor of the rifle known by his name, was born in Anjou in 1838, and entered Saint Cyr in 1855. At the breaking out of the Franco Prussian war, in 1870, he was a captain in the Sixty-ninth French Regiment of the Line. He was taken prisoner at Sedan. After serving in various capacities he was in 1885 appointed director of the shooting school at Chalons. After investigation and experiment he produced the new rifle, which was adopted by the War Office in 1887, and with which the whole French army is now supplied. The destructiveness of the weapon was demonstrated during the recent May riots at Fourmies.

Col. J. Albert Monroe, a well-known civil engineer, who had charge of the construction of the big iron bridge on the Thames River at New London, Conn., died in Providence. He was a native of Swansea, but removed to Providence when 15 years old. He left Brown University upon the outbreak of the war, and attained high rank in the service. After the war he took up the profession of civil engineering and was identified with important works in all parts of the country.

Peter A. Frasse, senior member of the firm of Peter A. Frasse & Co., 95 Fulton street, New York, died suddenly on the 9th inst. at Saratoga. Mr. Frasse was born in New York in 1823, and after being educated in France and Switzerland entered his father's business in 1844. This business was started by the elder Frasse in 1816 and was conducted from the beginning at 95 Fulton street, where it continues to flourish. Mr. Frasse was thus one of the oldest hardware merchants in New York and was very highly esteemed. He was a gentleman of unquestioned integrity and sterling worth, and his death is sincerely mourned by the many who knew him.

CORRESPONDENCE.

Dephosphorization in the Duplex Process.

To the Editor: In No. 23 of June 4 of your esteemed paper an article under the heading of "Southern Steel.—The Duplex Process Discussed," has been published refuting some points of a similar article published previously in the Alabama *Daily News*. As the question of the manufacture of basic steel is acquiring every day a greater importance, especially in view of the fact that the Southern States are very naturally trying to introduce basic methods to make steel from their home products, I beg leave to use the publicity of your paper to express some personal views on the matter, which, I hope at least, may prove of some interest to your readers. These views are either based on personal experience in the basic process or on experiments made by others and gathered from the leading European technical papers. According to your correspondent, Southern pig, at least the highly siliceous pig iron of Ensley, could not be dephosphorized in the open-hearth process after having been previously desiliconized in an acid vessel, for the reason that such a desiliconized pig iron would not carry carbon enough for the dephosphorization in the open-hearth process. We quote, indeed, from this paper: "It seems to be a perfectly established fact that phosphorus must be removed in the presence of carbon when the furnace is used, this being exactly the opposite to what takes place in the basic converter. All the information I have been able to gather from the technical papers seems to fully bear out this point. All the English experts insist upon it and the practice in America, so far as I know it, shows the same necessity." A little further on we read again: "The most economical practice is to so proportion the contents of carbon and phosphorus that the latter will all be eliminated, while the former is still above 0.20 per cent. when making steel below 0.10 per cent. carbon." After this your correspondent shows that Ensley pig iron containing on the average 3.35 per cent. of carbon and 2.75 to 3.00 per cent. of silicon could not be desilicized completely without reducing at the same time carbon to less than 1.00 per cent. He says, indeed, that carbon will be "down to 1.00 per cent. when silicon is down to 0.3 per cent." In other words, he comes to the conclusion, that the highly siliceous pig iron from Ensley could not be desiliconized without removing the greatest part of carbon, thus rendering the iron unfit for dephosphorization in the open-hearth process.

Such a composition of iron would indeed be entirely unfit for treatment in the basic open-hearth process if, as he says, it were "necessary to have about five times the amount of carbon as phosphorus with the latter at 0.3 per cent. in the bath and about three and a half times the amount of carbon as phosphorus when the latter is from 0.5 to 0.6 per cent." Then he continues: "Of course, the lower the content of phosphorus in the bath the harder it is to remove it. In order to get it below 0.02 per cent. it is almost always necessary to 'pig back' under any circumstances. The pig which it is projected to use at Ensley has 0.6 per cent. of phosphorus. The bath would, therefore, require from 1.90 to 2.10 per cent. of carbon to insure good and economical work. This pig also contains 3.35 to 3.50 per cent. of carbon, and from 2.75 to 3.00 per cent. of silicon. When this silicon would be reduced to 0.5 per cent. by blowing, the carbon would certainly be below 1.4 per cent. This amount of carbon is not enough to carry 0.6 per cent. of phosphorus."

In *résumé* I may state that your correspondent's opinion is that:

1. Phosphorus must be removed in the presence of carbon in the open-hearth process.

2. It is necessary to have about five times the amount of carbon as phosphorus with the latter at 0.3 per cent. in the bath and about three and a half times the amount of carbon as phosphorus with the latter from 0.5 to 0.6 per cent. in the bath.

3. A highly siliceous pig iron cannot be economically used in an open-hearth furnace even after a previous deciliconizing, for the reason that after silicon has been reduced to a minimum carbon also will be so low that the iron will be unfit for dephosphorizing in the open-hearth furnace.

Before showing by results obtained in actual practice that not only it is not necessary to have either five or three times more carbon than phosphorus in the bath, but that dephosphorization can be carried on in the presence of any amount of carbon and is even easier obtained when no carbon at all is present, whether in the open-hearth process or in any other process, I beg leave to dwell for a short while on dephosphorization in general.

Phosphorus, like carbon, silicon and manganese, is eliminated from the metallic bath by oxidation. Silicon, which has a very great affinity for oxygen, especially at high temperatures, is always removed from the metal before any of the other impurities. Carbon and phosphorus also have very strong affinities for oxygen, but, whereas, the power of carbon to combine with oxygen increases with the temperature, it is generally admitted that phosphorus is more easily eliminated at a rather lower temperature. Practice shows that, according to the treatment to which pig iron is submitted and according to the temperature in the furnace, phosphorus can be removed either before or after carbon or almost simultaneously with carbon.

Thus in Bell's and Krupp's pig-washing process, where the liquid metal is submitted at as low a temperature as possible to the action of a strong basic slag (made either of an excess of iron oxide or of iron and manganese oxides together), with which it is allowed to mix continuously and most intimately, phosphorus is practically removed entirely, whereas toward the end of the operation 95 per cent. of the carbon is still left in the bath.

It may be stated that the pig-washing process is based on the property of phosphorus to be easily removed (1) at a low temperature and (2) when in presence of and in intimate mixture with an excess of suitable liquid basic slag, with which the phosphoric acid generated can form at once a stable compound and be carried off in the slag.

Table I.—First Experiment.

	Before fusion.	After fusion.	½h	1h	1½	2h	2½	3h	3½	4h	4½	Finish'd metal.
Carbon	2 30	0.42	0.23	0.17	0.094	0.075	0.07	0.060	0.05	0.045	0.05	0.13
Silicon	0.87	0.060	0.070	0.070	0.050	0.040	0.045	0.050	0.045	0.025	0.010	trace.
Phosphorus	2.30	1.220	1.180	1.00	0.084	0.700	0.480	0.330	0.192	0.116	0.085	0.065
Manganese	0.96	0.080	0.060	0.088	0.062	0.640	0.600	0.850	0.620	0.080	0.051	0.051
Sulphur	0.23	0.223	0.213	0.206	0.183	0.170	0.165	0.157	0.160	0.137	0.130	0.125
CORRESPONDING SLAGS.												
SiO_2	.....	22 9	.....	.....	.....	.....	.....	.....	.....	.....	.....	17.20
Fe_2O_3	.....	1.17	1.03	1.85	1.90	.....	1.23	1.75	2.20	1.40	.....	2.30
FeO	.....	14.90	10.40	7.20	5.94	.....	5.91	6.61	9.09	9.91	.....	13.30
Al_2O_3	.....	14.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.20
MnO	.....	3.69	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.64
CaO	.....	28.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	33.60
MgO	.....	1.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.27
P_2O_5	.....	12.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	16.19
Fe	.....	11.90	8.96	6.90	5.97	.....	5.45	6.38	7.10	8.75	.....	9.88

In the basic Bessemer process, on the contrary, the bulk of phosphorus is only removed when carbon is entirely eliminated. Here the phosphoric acid formed at every moment by the contact of phosphorus with air cannot combine with lime and be carried off into the slag, because lime is not liquid while decarburization is proceeding, and consequently not fit to bind phosphoric acid in the slag.

This is so true that whenever the slag is made effectively basic by liquefying it through the addition of fluor spar, nearly all the phosphorus will be removed before any considerable amount of carbon has been oxydized. (See "The Metallurgy of Steel," p. 61, vol. 1, by Henry Howe.)

This last point has been observed many times by the writer in his practice with the basic Bessemer process. Thus in the ordinary basic Bessemer process phosphorus leaves only after carbon has been oxidized, but, if desired, is is very easy to remove phosphorus before any amount of carbon has been oxidized.

In the basic open-hearth process conditions are entirely changed. Here the oxidition of the different impurities is obtained by means of the oxidizing slag. If this slag, as is generally the case, is made sufficiently basic from the start by addition of lime or limestone, then there is no reason why phosphorus once oxidized should not be retained at once in the slag. Consequently dephosphorization can be finished before the whole of the carbon is eliminated. This shows that in all these processes phosphorus will be removed permanently whenever it comes in contact with a suitably basic slag under the right conditions to form a stable compound. It

follows that in the basic open-hearth process the presence of carbon is not required. It simply means that phosphorus is removed, or at least can be removed, before all the carbon is gone, whenever it is allowed to come in intimate contact with a highly basic slag, which will eliminate it at once and permanently from the metallic bath. In short, it may be stated that phosphorus will be removed from any iron bath whenever the conditions of basicity and liquidity of the slag are favorable, whether carbon be present or not.

Now that we have endeavored to show that dephosphorization will happen under the above stated conditions, it may be well to state that the presence of carbon is rather detrimental to dephosphorization. Carbon at high temperatures has powerful reducing qualities—that is to say, its action upon numerous oxides at high temperatures is strong enough to deprive them of their oxygen. The whole theory of fusion. It can be seen at once to what extent the different elements had been reduced during that fusion. However, as this point does not interest us so much as the composition of the bath in comparison with the composition given by your correspondent, we may suppose that the metal has been melted in a cupola and poured into the open-hearth furnace, and that at that moment the composition of the metal was as indicated in the column "after fusion" The composition of that metal, as far as carbon and phosphorus are concerned, is: Carbon, 0.42 per cent.; phosphorus, 1.220 per cent. Here phosphorus is neither 0.3 nor 0.6 per cent., so it is pretty difficult for me to know in what category your correspondent will put the present case It must be remembered that he stated that it is "necessary to have about five times as much carbon as phosphorus with the latter at 0.3 per cent. in the bath, and about three and a half times the that carbon has absolutely nothing to do with dephosphorization, unless its action might be considered as detrimental to dephosphorization. It can indeed be seen easily in the two preceding tables that while there is still some carbon left in the bath dephosphorization is slower than after all the carbon is practically gone.

However, the author of the aforesaid experiments tried to discover the reason why the second experiment was so very different from the first one, and he attributed it solely to the composition of the slag. The more oxide of iron it contains the greater is its oxidizing power and the less carbon it will leave in the bath. In the discussion of those experiments at the meeting it has been pretty generally admitted that the dephosphorization in the first experiment was quicker than in the second one, on account of the greater basicity of the slag, and this even in spite of the fact that the contents of carbon in the

Table II.—Second Experiment.

	A	B	½	1h	1½	2h	2½	3h	3½	4h	4½	5h	5½	6h	6½	Finished metal.
Carbon	.....	.....	1.76	1.68	1.39	1.26	0.84	0.51	0.40	0.22	0.09	0.075	0.075	0.075	0.07	0.14
Silicon	.....	.....	0.075	0.075	0.070	0.090	0.080	0.060	0.060	0.040	0.035	0.030	0.020	0.018	0.010	traces
Phosphorus	.....	.....	1.40	1.37	1.32	1.11	0.99	0.90	0.81	0.70	0.62	0.46	0.30	0.18	0.035	0.075
Manganese	.....	.....	0.100	0.100	0.115	0.09	0.10	0.08	0.09	0.075	0.085	0.100	0.110	0.125	0.120	0.637
Sulphur	.....	.....	0.180	0.169	0.162	0.15	0.145	0.140	0.145	0.147	0.137	0.133	0.123	0.120	0.110	0.089
CORRESPONDING SLAGS.																
SiO_2	14.40	0.40	23.60	3.80	0.77	0.90	2.60	2.30	1.60	1.17	1.17	1.96	....	....	17.40	.....
Fe_2O_3	6.31	21.50	0.73	6.75	7.28	6.21	6.35	7.38	4.77	5.31	4.10	4.10	....	....	1.64	.....
FeO	44.20	.....	8.07	....	....	....	....	....	....	....	....	....	....	....	4.53	.....
Al_2O_3	2.04	.....	8.15	....	....	....	....	....	....	....	....	....	....	....	4.60	.....
Mno	6.80	.....	7.00	....	....	....	....	....	....	....	....	....	....	....	7.50	.....
Cao	14.00	.....	38.10	....	....	....	....	....	....	....	....	....	....	....	44.00	.....
Mgo	0.84	.....	1.28	....	..	....	....	....	....	....	....	....	....	....	2.80	.....
P_2O_5	10.00	.....	12.45	....	....	....	....	....	....	....	....	....	....	....	15.75	.....
Fe	38.90	.....	6.79	....	....	....	....	....	....	....	....	....	....	....	4.63	.....

Remark.—A and B samples taken during the fusion.

he metallurgy of iron and other metals is based on this property of carbon and its derivate, carbonic oxide.

The power to deprive metallic and other oxides of their oxygen is indeed so strong that even the phosphoric acid formed in the bath and carried off as phosphate into the slag is often decomposed when in contact with carbon and the phosphorus will re-enter the bath. This fact is well known, and in the early time of the basic Bessemer process sometimes created much trouble and still does so to-day, as invariably a certain amount of phosphorus is re-entering the metallic bath after recarburation.

In order to more forcibly show that the presence of carbon is not required in the dephosphorization in the open-hearth furnace I will illustrate it by some tests made in Europe on that subject.

There was read in 1885 before the May and September meetings of the Iron and Steel Institute the following paper: "Notes on Some Experiments Relative to the Elimination of Metalloids in the Basic Open-Hearth Furnace," by F. W. Harbord.

The proportion of metalloids disappearing during the fusion in the basic open-hearth furnace is considerable. In a first experiment, fusion being complete after four hours, it was found that 98 per cent. of silicium, 93 per cent. of manganese, 40 per cent of phosphorus and 81 per cent. of carbon had been oxidized.

The first column of Table I shows the composition of the metal before fusion. The second column, four hours afterward, shows the composition of the metal after amount of carbon as phosphorus when the latter is from 0.5 to 0.6 per cent."

In column 3h we find that phosphorus is down to .330 per cent. By applying the above-named rule carbon would be 0.33 x 5 = 1.65 per cent., whereas in reality it is only 0.06, and nevertheless its dephosphorization is going on continually. In column 1h the metal is already a soft metal, because carbon is down to 0.17 per cent, whereas phosphorus in still 1.00 per cent. From that moment on, but especially from the next column, 1½, on, dephosphorization proceeds steadily, and that with practically no carbon in the bath.

The first experiment is already very conclusive, but in order to prove more fully what I intend to show I will give the second experiment made in the same tests. (See Table II.)

In this second experiment the fusion lasted about four hours. The composion of the initial pig iron is not given, but is said to have been little different only from the one in experiment No. 1, consequently not enough to explain the difference between this experiment and the first one.

Column ½ shows the contents of the both to be: Carbon, 1.76; phosphorus, 1.40; very different from the proportion given by your correspondent. In column 4½ the carbon is practically eliminated, while phosphorus is still at 0 62.

In other words, according to your correspondent's rule the carbon in this column ought to be 0.62 x 3.5 = 2.17 per cent. in order to dephosphorize, whereas in reality it is only 0.09 per cent. I think that it could be considered as sufficient proof first experiment was very low in comparison with the contents of the same element in the second one. Indeed, if we make a comparfsion between these two experiments we shall see that in the column "after fusion" the metal contains in the first experiment carbon 0.42 and phosphorus 1.220, whereas the metal in column 1 of the second experiment contains carbon 1.68 and phosphorus 1.37. This last metal, containing more carbon and less phosphorus than the metal of column "after fusion" in the first experiment, is nearer the composition indicated by your correspondent and dephosphorization ought to be quicker, whereas, in reality this metal is only dephosphorized after six hours, while the first one is dephosphorized after five hours.

We must also call the attention to the very instance quoted from your correspondent's article and referring to the practice of the Phœnix Works at Ruhrort, Germany, of which Herr Thielen says: "They used 60 to 70 per cent. scrap and had a grayish or white pig iron, containing from 2 to 2½ per cent. of phosphorus. Their charges were worked, of course, much more rapidly. With a basic Siemens furnace they burned out two and a half times the quantity than could be done if they employed pig iron and so had to waste two thirds of the time in purifying pig iron." Then he continues: "The above means that from five and a half to six heats are made in 24 hours from a mixture containing about 1.25 per cent. carbon and 1.50 per cent. phosphorus. This work is done on cold stock, &c." Your correspondent admits that "the fact re-

mains, however, that the phosphorus content is greater then the carbon content, and good work is done, but he does not understand how it is done." as Mr. Thielen does not explain it. If Mr. Thielen does not explain, I judge he did not consider it worth while to do so, and that he supposed that every steel man knew that the presence of carbon is not required in the dephosphorization in the open-hearth furnace. Another instance might be taken from the paper read before the Pittsburgh International Sessions, October, 1890, of the American Institute of Mining Engineers by Dr. Herman Wedding, on "The Progress of German Practice, &c."

In this pamphlet we read, page 48, in relation to the practice followed in the basic open hearth department at Hoerde: "The newer furnaces showed 300 to 350 heats and the older ones 180 to 250 heats. They are run with scrap and about 20 to 25 per cent. of pig. Ore is used (Siemens process) only in small quantities, so far as it may serve to correct the carbon contents of the bath. If the scrap is in convenient form six heats in 24 hours can be made in the newer furnaces. These furnaces are also fitted to combine the Thomas and the Martin processes. For this practice Thomas metal is blown down to 0.3 per cent. phosphorus in the converter to the limit; that is, at which the second lime addition would have to be made, and no considerable oxidation of iron has yet occurred. The Thomas metal is then conveyed in a ladle to the open hearth and there finished. One furnace can easily make eight to nine such heats in 24 hours, and the Thomas metal is thereby converted into excellent open-hearth product." I suppose that your correspondent admits, with me, that when pig iron is blown in a converter to the point where the second addition of lime will have to be made, the iron practically contains no more carbon. So here we have a metal containing 0.3 per cent. of phosphorus, no carbon, which, however, gives excellent steel in the open-hearth process and from eight to nine heats in 24 hours.

According to your correspondent's views, a metal with 0.3 per cent. phosphorus must contain $0.3 \times 5 = 1.5$ per cent. carbon to be dephosphorized in the basic open hearth. Nevertheless, the aforesaid metal, containing no carbon, is dephosphorized in current practice, and, what is more, at the rate of eight to nine heats in 24 hours. I say even that for the very fact that this metal is previously purified—that is to say, freed from its silicon and carbon—this rapid dephosphorization in the open-hearth furnace is made possible.

Another instance is furnished by an experiment made in France, of which mention has been made by Mr. Gautier before the May and September meetings of the Iron and Steel Institute, 1886. In the discussion of the experiments made by Mr. Harbord, and previously quoted, regarding the elimination of metaloids from the metallic bath, Mr. Gautier quotes the following experiment: Pig iron containing 1.5 per cent. phosphorus and 2 per cent. silicon was blown in an acid converter until all the carbon was eliminated. The metal was then cast into ordinary ingot molds. It was found to contain 0.20 per cent. carbon, 1.70 per cent. phosphorus and 0.05 per cent. silicon. The cold ingots were afterward put into an open-hearth furnace with a neutral chrome lining, there to be dephosphorized. When the fusion was over there was only 5 per cent. of the original phosphorus left. In other words, the metal had been dephosphorized during the smelting down to 0.085 per cent., and practically no carbon was present.

Another similar experiment was quoted by me some time ago in an article published in the Chattanooga *Tradesman*. In the article I said that Mr. Walraud, a French metallurgist, treated Luxemburg pig iron, containing 2 per cent. phosphorus, in an acid converter, and cast the metal into ingots after practically all the carbon had been removed. The ingots contained: Silicon, 0.01; carbon, 0.05; sulphur, trace; manganese, 0.02, and phosphorus, 2.10 per cent. This metal, with practically no carbon, but with 2.10 per cent. of phosphorus, was afterward treated in a basic open-hearth furnace in a charge made up as follows:

	Tons
Initial phosphorus pig-iron bath	0.60
Desilicized and decarbonized metal	3.80
Scrap	1.00
Total	5.40

The necessary amount of limestone was added. A short time after the fusion dephosphorization was complete and steel of excellent quality was obtained. I think that it is not necessary to go any further and that I have shown conclusively that carbon is not required in the dephosphorization in the open-hearth process, but that, for the reason previously enumerated, its presence is rather detrimental to dephos phorization.

Besides, I must state that some time ago I suggested to repeat Mr. Walraud's experiment in steel works in the South; this will be done and I hope will prove by an experiment made in the United States that no carbon is required in the dephosphorization.

When pig iron is desiliconized and decarbonized and then cast into solid shape, charged afterward in that state into the basic open-hearth furnace, there to be dephosphorized in presence of the necessary basic additions (third case indicated by Mr. Luetscher), it is easy to understand why dephosphorization is almost entirely done when the fusion is over.

The only element that remains to be oxidized in such metal is phosphorus. But, as already stated, phosphorous is only eliminated when, once oxidized, it is brought immediately into intimate contact with an excess of strong base.

Now, when the cold stock of such iron, intimately mixed with limestone, is melting in the open-hearth furnace, every drop of liquid metal at once comes in contact with limestone, and by a kind of liquation phosphorus acid will unite at once with lime and be carried off into the slag, thus leaving a metal almost entirely free from phosphorus. As no carbon, or practically none, is present, none has to be eliminated, and the heat will be much more rapid.

I beg to add a few words more in regard to the practice of "pigging back" in order to eliminate the last particle of phosphorus. This practice, indeed, helps dephosphorization as in the ordinary acid open hearth it helps to remove the last particle of even carbon if very soft steel has to be obtained. But in this case carbon is not introduced because its presence is required in the dephosphorization as a chemical agent, but it is introduced more as a mechanical agent which, by the oxidation of the carbon contained in the pig, gives rise to a renewed action in the rather dull bath and helps to bring the metal in more intimate contact with the slag, thus hastening the removal of the last particle of the element that it is intended to remove.

I have not the intention to speak here of cost prices. These will be governed by the prices of raw material and labor. That raw materials, or rather suitable pig iron (desiliconized and decarbonized, wherever required), coal, limestone and even dolomite or chrome ore for furnace linings, can be obtained at a cheap price in the South, is a well known fact.

Before concluding, however, I beg leave to quote the last sentence from your correspondent's paper. He says: "Finally, I would respectfully call to the mind of any intending inventor Mr. Punch's well known advice to a young man about to be married, 'Don't'; adding, 'at least, not yet.'"

I don't exactly know, but this remark may be classified with this other one: "Don't enter the water until you know smimming."

I think that if some one wants to learn swimming he had better enter the water at once.

If experience is necessary to make basic steel, it will take just as much money in ten years as it will to day in order to obtain it.

The only real experience required is the experience of one expert superintendent and a few men more, as all the rest of the work will be absolutely the same as any other acid Bessemer or open-hearth process. So I do not see why a company ought to lose $250,000 for the first 18 months.

J. NAU.

NEW YORK, June 15, 1891.

The Strength of Malleable Iron.

William Forsyth, John MacKenzie and E. D. Bronner, a committee of the Master Car Builders' Association have reported what are believed to be the first published tests of the strength of malleable cast iron. The report is as follows:

A thin section being necessary to secure superior strength in malleable castings, it seemed evident that in a casting like the M. C. B. coupler 1 inch and 1¼ inches thick in the arms and lugs, we would not get the advantage of the high strength and ductility usually attributed to malleable iron. This fact has such an important bearing upon the question whether malleable cast iron is the most economical material for the M. C. B. coupler, that we have made some investigation of the strength of malleable castings of various thicknesses, from ½ inch up to 1¼ inches, increasing by eighths, and we present the results below.

The samples were obtained from the National Malleable Casting Company, Chicago, and were tested at the Chicago, Burlington and Quincy laboratory at Aurora.

Tensile Tests of Malleable Castings.

Nominal dimensions. Inches.	Actual dimensions. Inches.	Area in square inches.	Tensile strength per square inch.	Per cent. of elongation in 4 inches.	Elastic limit per square inch.
1⅛ x ¼	1.52 x 0.25	0 38	24,700	2 2	21,100
1⅛ x ⅜	1.52 x 0.39	0.593	33,700	2 2	15,200
1⅛ x ½	1.53 x 0.5	0.765	32,800	2 2	17,000
1⅛ x ⅝	1.53 x 0.64	0 979	32,100	2 2	19,400
2 x ¾	2 x 0.78	1.56	25,100	1½	15,400
1⅛ x ⅞	1.53 x 0.88	1 355	33,600	1½	19,200
1 x 1	1.06 x 1.03	1.08	30,600	1	17,600
1¼ x 1¼	1.28 x 1.3	1.664	27,400	1	... .
1½ x 1½	1.52 x 1.54	2.341	28,200	1½	.....

While the results do not show any regular reduction of strength with increased thickness, yet it is plain that the average strength of the thin specimens is much greater than that of the thick ones. Thus the average strength of pieces ½ inch thick up to ⅝ inch, inclusive, is 33,300 pounds, and of the thick pieces, ¾ inch up to 1½ inches, inclusive, only 28,980 pounds, the thin speciment being 15 per cent. stronger than the thick ones. But the most important fact brought out by these tests is the low ductility of malleable cast iron, whether thick or thin. The specimens ½ inch and ⅝ inch thick had an elongation

of only 2 per cent. in 4 inches, and those 1 inch and 1¼ inches thick only 1 per cent. in 4 inches.

We can now give the tensile resistance and ductility of malleable cast iron, as compared with that of other metals suitable for those details of cars which are subject to severe blows. Current specifications for wrought iron require a strength of 50,000 pounds and an elongation of 20 per cent. in 4 inches. For good cast iron, 20,000 pounds; for steel castings, 60,000 pounds and 10 per cent. elongation in 4 inches.

Comparative Tensile Resistance and Ductility of Malleable Cast Iron and other Metals.

	Ultimate strength. Pounds per square inch.	Strength rank with cast iron as unity.	Per cent. of elongation in 4 inches.	Ductility rank with malleable iron as unity.
Cast iron	20,000	1	0.35	.....
Malleable cast iron	32,000	1.6	2.00	1
Wrought iron	50,000	2.5	20.00	10
Steel casting	60,000	3	10.00	5

Fast Torpedo Boats.

An eminently successful trial of a torpedo boat just completed by Messrs. Thornycroft & Co. for the Government of the United States of Brazil took place in the estuary of the Thames on the 2d inst. The new vessel is 150 feet long by 14 feet 6 inches beam, there being four torpedo guns suited for the 14-inch Whitehead torpedo. Two of these torpedo tubes are mounted on racers on deck and two under deck in the bows, arranged not in the ordinary way, but with gear enabling them to be protruded through doors in the skin of the boat. The machinery consists of two sets of triple compound engines, supplied with steam by two Thornycroft water-tube boilers. The trial consisted of two parts: 1, a series of six runs on the measured mile with a load of 19 tons on board, during which a speed of 25 knots was guaranteed by the builders; and, 2, a continuous run of two hours duration, during which a speed of 24 knots was guaranteed. The results of the six runs were as follows:

	Knots.	Mean revolutions per knot.
First run, with tide	27.692	1065.5
Second run, against tide	23.529	1289
Third run, with tide	28.346	1064
Fourth run, against tide	23.377	1290.5
Fifth run, with tide	28.346	1062.5
Sixth run, against tide	23.829	1282.5

The mean of these speeds, computed by the Admiralty method, being 25.858 knots, Messrs. Thornycrofts' guarantee was more than fulfilled. The mean number of revolutions required to do a knot was found to be 1165.4. At 1:18 p.m. the vessel was put upon her two hours' run, and at 3:18 it was found that the mean number of revolutions of the screws amounted to 59.174, which, being divided by 1165.4, the number required to complete a knot in still water, gives a distance of 50.775 nautical miles, or 58.4 statute miles, covered in the two hours. This showed an average speed of 25.387 knots, which, it is claimed, is the greatest distance ever run and highest speed maintained by any vessel in the time. During the run steam was blowing off from both boilers, and the pressure of 210 pounds per square inch was maintained with ease, there being an air pressure in the stokehold of only 1½ inches of water.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 16, 1891.

The chiefs of the Bureaus of Construction and Engineering of the Navy Department are already beginning to compile the data which will complete the record of the fiscal year now drawing to a close. The official reports will not be submitted in form to the chief of the Department until fall, but the gathered material for these important official narratives presents in advance an exhibit of what has been accomplished in construction and what new achievements have been reached in new designs and their application to hulls, machinery, armor and armament. The past fiscal year has been one of judicious expenditure on a vast amount of excellent work. The acquisitions to the modern navy have been marked by the completion of several of the finest types of vessels afloat. The steady progress of work upon the vast floating engines of battle has been satisfactory in every respect and the test of these ships in actual service has sustained the high reputation which had been claimed for them in servicability and speed. The report on the preliminary tests of the Vesuvius in Hampton Roads, which was not as encouraging as desired, is not regarded as final. The officers who witnessed the performances of her guns claim that the defects can be remedied and the vessel will be so perfected in the use of her appliances for aerial torpedo throwing that she will become a formidable power in the use of the destroying forces of modern naval warfare. The Department is determined to avail itself of every opportunity of skill and ingenuity to make the vessel a success.

The Secretary of the Navy is still considering the award of the contract for the building of the Triple Screw Cruiser No. 13. The Bath Iron Company were the lowest bidders. The Secretary, however, has discretion in the matter of ascertaining whether the bidders have the facilities for the successful performance of the work. It is not a question of rejecting the vessel if does not come up to the requirements of the contract, but of reasonable assurance that the work will be satifactorily done and that the Government at the end of the time specified in the contract will be placed in possessson of another ship.

The Bureau of Ordnance of the Navy Department is making elaborate preparations for another test of armor plates at the Indian Head proving grounds. The tests are expected to take place about the end of July, but the date will depend upon the completion of the plates and the readiness of other details of the undertaking. This series of tests will be the most important, as the plates will be of the larger sizes and the projectiles correspondingly great in size and weight. The piercing quality of the projectile and the resisting quality of the armor plate will constitute the chief feature of the experiment. The all-steel, steel and nickel and all-nickel plate of American manufacture and the Holtzer and best American made shells will be used. A number of naval and army ordnance experts will witness the firing, while a corps of officers in charge of the experiments will keep the record. While other tests will be had, as advances are made in plates and projectiles, those now in view are expected to determine certain qualities which lead to the adoption of a standard plate for our own naval use.

A great deal of interest is manifested in the 12 inch army steel gun recently turned out at the Watervliet Arsenal, New York. This is the largest caliber yet manufactured in guns in the United States. The final tests are, therefore, engaging the attention of the experts in both arms of the service. There has always existed a laudable emulation between the ordnance departments of the two branches of the service, and neither need be ashamed of their work in comparison with the best high-power guns of the greater warlike nations of Europe. Although the manufacture of these guns is of very recent date in the United States, we stand second to no gun in the world in results. We surpass the English and French guns and stand abreast of the celebrated Krupp gun of Germany. This our officers propose to exceed.

The New Wages Scale.

WESTERN SCALE.

The report of the Wage Committee appointed by the Association of Manufacturers of Iron, Steel and Nails and the National Amalgamated Association of Iron and Steel Workers has just been issued, governing wages in the rolling mills and nail factories west of the Allegheny Mountains.

The introductory paragraph in the new scale proposed adds the following section:

The time in scrapping and busheling, also finishing and all other departments, shall in no case exceed nine hours from the time the first heat is charged until charging shall cease, this not to apply to boiling departments (except scrapping and busheling), also rod mills, wire mills, nut and bolt works, and other departments working under the eight-hour system.

Boiling.—The scale remains unchanged, but in the accompanying notes the following changes have been made:

1. The charge for boiling furnaces shall be as follows: Single furnaces, not less than 500 or more than 550 pounds per heat; double furnaces, not less than 1000 or more than 1100 pounds per heat; Siemens furnaces, not less than 1400 nor more than 1550 pounds per heat; double double furnaces, not less than 2000 or more than 2200 pounds per heat, and the two weeks' work shall be averaged.

2. In order to insure uniformity of iron in boiling furnaces and avoid the increasing custom of running in strong for common iron, thus increasing the hours and work of the boiler, the limit of time for each heat shall be as follows: For a single furnace, 1 hour and 45 minutes; for a double furnace, 1 hour and 50 minutes; for Siemens furnace, 1 hour and 55 minutes, and for a double double furnace, 2 hours. The time shall be reckoned from the time the door is dropped after charging until the heat is ready to draw, and accidents and unavoidable detentions are not to be reckoned in. When a majority of the furnaces in any mill require more than the time specified to make their heats, due notice shall be given to the boss, in accordance with Article X of the constitution. By the word majority is meant a majority of the furnaces working hard iron; inferior coal, tools and scarcity of ore and scrap, or any of them, shall be considered a grievance.

10. Busheling on cinder bottom to be one-half the price paid per ton for boiling. When working muck bar crop ends alone $3.57 per ton shall be paid.

13. That the puddlers and boilers be paid for all blooms and sliders equivalent to 490 pounds where the charge is 500 pounds per heat when it is no fault of the boiler

Muck or Puddle Mill.—No change has been made.

Scrapping and Busheling.—The rate has remained the same, but the following note has been somewhat changed:

3. Busheling scrap and wrought-iron turnings mixed on sand bottom to be 30 cents per ton above the current price for piles on boards.

Knobbling.—No change has been made, the rate remaining $4.70 for scrap knobbling and $6.11 for refined iron on a 2-cent card.

Heating Slabs and Shingling. — No change has been made.

Bar and Nail Plate Mills.—The rate remains the same, but slight changes have been made in the accompanying notes:

1. All sizes below 1½ x ¼ inch flats, 1 inch rounds and ⅞ squares when worked on a bar mill to be paid for at guide-mill prices. One-inch rounds when worked by hand on a bar mill shall be paid for at guide-mill prices.

2. All sizes below 1½ x ¼ inch flats, 1 inch rounds and ¾-inch squares when worked on a 12-inch mill to be paid for at guide-mill prices. One-inch rounds when worked by hand on a 12-inch mill shall be paid for at guide-mill prices.

7. On all bar mills working bar or skelp iron one man's help shall be furnished by the firm on piles of 150 pounds, and an additional man for 250 pounds, to shove under at the rolls, on all passes. This shall not apply to mills now giving extra help, provided, further, that no help shall be furnished on piles or billets weighing less than 150 pounds.

The following sections in the old scale have been omitted:

8. Night-turn rollers on bar, 12-inch and skelp mills shall be paid at the rate of 50 per cent. of what the mill turns out on his turn, he to pay no one, except he employs a man to do his own work, in which case the night-turn roller must pay such help.

9. Roughing down on bar and 12-inch mills shall be not less than 30 per cent. of the rollers' wages.

10. Roughing up on bar and 12-inch mills shall not be less than 42½ per cent. of the price paid for catching on such mills.

Guide, 10-Inch, Hoop and Cotton-Tie Mills.—The rate remains unchanged, with the following clause added:

It is understood, however, that this arrangement shall in no way detract from the authority of the roller in controlling all hands on mill, including hiring and discharging, and, as heretofore, the roller shall be held responsible for the work done.

In T iron the following two additional rates are given:

Sizes.	Roller.	Heater.	Rougher.	Catcher.
1 x ¾ Y steel..	$3.40	$1.70	$0.85	$0.85
1¼ x ⅛ Y Steel..	2.05	1.02½	.51¼	.51¼

Y steel 10 per cent. extra for cut lengths.

T iron of unequal sizes shall be classed with ¾ T iron.

In hoop and cotton tie mills the following additional rate is given:

Sizes.	Roller.	Heater.	Rougher.	Catcher.
1¾ milk can hoop iron	$2.05	$1.02½	$0.51¼	$0.51¼

The following changes are made in the notes:

3. All sizes made from a regular 2-inch and lighter reworked billet made from all muck iron, all steel hoops made from 1¾ inch and lighter reworked steel billet, all steel product from 1¾ inch and lighter steel billet, and cut to regular weight, 25 cents per ton less for rolling, 12½ cents per ton less for heating, 6¼ cents per ton less for roughing and 6¼ cents per ton less for catching be paid.

9. Where a mill averages over $32 per day a third rougher shall be employed during the months of June, July and August on demand of roller, rougher and catcher. Said extra man shall assist both rougher and catcher and shall be paid one-half by roller and one-half by rougher and catcher.

Plate and Tank Mills.—The card remains the same, but the following clause has been added:

10. All sheet bars cut from crop ends and defective plates of iron or steel to be paid for at top and bottom prices.

Rolling Pipe Iron on Sheet and Jobbing Mills.—No change has been made, the rate remaining $3 40 per ton on a 2-cent card.

Sheet Mill.—The card remains unchanged at $3.60 for No. 8 and heavier, but the following modifications and additions have been made in the notes:

8. Sheet and jobbing mills working three turns, the shearing shall be divided between two shearmen, and no shearman be allowed to shear for more than two turns.

9. That shearman receive one-fifth, the same to be paid by the roller.

10. That no roller on sheet mills shall hold more than two turns.

11. Sheet mills working three turns that make tin and black plate shall be permitted to work three turns of eight hours each, of seven heats each turn.

12. Roll hands on sheet and jobbing mills shall be paid one day's work at laborer's wages for changing rolls

13. Heater to receive one-fourth of the above prices, and 3 cents per bundle extra, to be paid by the company, for all iron, No. 20 and lighter, annealed in an open furnace; shearman, one-fifth; roller to receive balance and pay rougher and catcher only.

14. That plates be designated as ending at No. 8 gauge, and firebed commence at No. 9 gauge and end at No. 19 gauge, and sheets to commence at No. 20 gauge.

15. That all mills working plates and firebed to No. 19 gauge shall be termed jobbing mills.

16. That all mills working sheet iron or steel when on firebed shall work under the same rules and rates as jobbing mills.

17. That neither of the above 15th or 16th clauses shall interfere with clause 12 of sheet mill hands' scale.

18 That the roller pays extra for working the spanner on chill rolls where there are two sets of rolls.

Sheet Mill Hands' Scale.—The rate remains the same, but the following change has been made in the notes:

11. On sheet and jobbing mills working two turns of eight heats each, and on mills working three turns of eight hours each, the day hands shall be paid a full turn's work in case of failure to make the eight heats in the time specified in memorandum of agreement, on a two-turn mill, or a full turn on a three-turn mill.

Roughing and Catching on Sheet and Jobbing Mills.—No change has been made in either the memorandum of agreement or the classification of work.

Tin and Black Plate Mills.—This remains unchanged.

Rolling Muck Bars and Finished Iron for Sheet Iron.—This still remains 50 cents on a 2-cent card for finished iron for sheet bars, and 45 cents per ton for muck iron.

Structural Mills.—There has been no change except that the following notes have been omitted in the new scale:

2. Night-turn rollers on 18 and 20 inch mills shall be paid at the rate of 50 per cent. of what the mill turns out on his turn, he to pay no one, except he employs a man to do his own work, in which case the night-turn roller must pay such help.

3. Roughing down on 18 and 20 inch mills shall be not less than 30 per cent. of the roller's wages, and roughing up on said mills shall be not less than 42½ per cent. of the catcher's wages on such mills.

In the large universal plate mill the pay of shearman has been made 65 cents for finished and unfinished iron, and the words "day turn" and "night turn" stricken out. The notes following small universal plate mill have been changed to read as follows:

1. All plates or surplus parts thereof, worked on large or small universal mills, that can be used for tops or bottoms for finished iron without reworking, shall be paid for at unfinished iron prices.

2. Steel plate crop ends rolled to lighter sizes on said mills shall be paid for at finished weight.

Continuous Trains.—No change whatever has been made.

Wire Rod Mills.—The agreement remains unchanged.

Journeymen Roll Turners.—The only change is in the clause naming 3 hours to constitute a half day, after the regular time, instead of 3 hours and 20 minutes, as in the old scale.

Scale for Spike Cutting.—The scale is unchanged throughout.

Nail Cutting.—The entire nail cutting price-list has been changed, as given in full below:

Size.	Self feeding.			Hand feeding.		
	14	15	16	14	15	16
COMMON BRADS, TOBACCO AND SLATING.						
2d	69.4	74.5	79.4	79.4	85 1	90.7
3d	45.4	48.6	51.9	51.9	55.6	51.9
4d	28.9	31	33	33	35.4	37.7
5d	33.9	36.3	38.7	38.7	41 5	44.2
6d	25.1	26.9	28 7	28.7	30.8	32.8
7d	19 3	20.7	22.1	22.1	23.7	25.2
8d	15.7	16 8	17.9	17.9	19.2	20.5
9d	13.4	14.4	15.3	15.3	16.4	17.5
10d	12.2	13.1	14	14	15	16
12d	11.1	11.9	12.7	12.7	13.6	14.5
16d	10.7	11.5	12.3	12.2	13.1	14
20d	10.1	10.9	11.6	11.6	12 4	13.3
30d to 60d	9.4	10.1	10.7	10.7	11.5	12.2
SPIKES.						
4-in. and under	9.6	.....	.....	10 9	11.7	12.5
4½ and up	8.8	.....	.....	10.1	10.8	11.5
CLINCH.						
1½	37.2	39.8	42 5	42.5	45.5	48.6
1¾	46.7	50.1	53.4	53.4	57 2	61
2 and 2¼	30 6	32.8	35	35	37.5	40
2½ and up	24.5	26.2	28	28	30	32
FENCE.						
6	18.4	19.7	21	21	22.5	24
7	15.1	16.2	17.3	17.3	18.5	19.8
8	11.7	12 4	13.3	13.3	14 2	15 2
9	10 1	10.9	11.6	11.6	12.4	13.3
10	9.6	10.2	10.9	10.9	11 7	12 5
FINISHING.						
¾	226.1	242.2	258.4	258.4	276.8	295.3
1	140 4	150.3	160.4	160.4	171 8	183.3
1¼	91.1	97.7	104 2	104.2	111.6	119.1
1½	57.1	61 1	65.2	65.2	69 9	74.5
1¾	67.4	72 2	77	77	82.5	88
2	49	52.5	56	56	60	64
2¼	41.9	44 9	47.9	47.9	51.3	54.7
2½	31.6	33.9	36.1	36.1	38 7	41.3
2¾	29.1	31.2	33.2	33 2	35.6	37.9
3	24.5	26.2	28	28	30	32
3¼ x 3½	21 8	23.4	24.9	24.9	26.7	28.5
4-in.	20.5	22	23.4	23 4	25.1	26.7
FINE.						
2	91.1	97 7	104 2	104.2	111.6	119.1
3	74.9	80.2	85.6	85.6	91.7	97.8
4	45.4	48.6	51.9	51.9	55.6	59.3
CASING.						
3	69.4	74 5	79.4	79.4	85.1	90.7
4	41.4	44.4	47.3	47.3	50.7	54.1
5	47.3	50.6	54	54	57 8	61.7
6	36.7	39.4	42	42	45	48
7	30.6	32.8	35	35	37.5	40
8	24.5	26.2	28	28	30	32
9	21	22.6	24.1	24.1	25.8	27.5
10	19.9	21.2	22.7	22.7	24.3	25.9
12 up	17.4	18.6	19.9	19.9	21.3	22.7
LINING.						
¾	123.9	.....	.....	141.7	.....	.....
⅞	108.5	.....	.....	124	.....	.....
⅞ fine lining	140.4	.....	.....	160 4	.....	.....
SHINGLE.						
5	33.9	36.3	38 7	38.7	41.5	44.2
8	19.8	20 7	22.1	22.1	23.7	25 2
9	15.7	16.8	18	17.9	19.2	20.5
10	12.2	13.1	14	14	15	16
BARREL.						
⅝	134.3	142.7	151.1	158.4	168.1	172.7
¾	99.4	105.6	111.9	118.6	120.7	127.9
⅞	69 4	73.8	78 1	79.4	84 9	89.3
1	54.1	57.5	60.9	61.8	65.7	69.6
1¼ x 1¼	43.4	46.5	48.8	49.6	53.1	56 7
1⅜ x 1½	28.9	31	32.5	33	35 4	37.7
BOAT SPIKES.						
4 and under	19.1	.....	.....	21.9	23.5	25
4½ and up	17.6	.....	.....	20.1	21.5	23

1. For making tools the company shall furnish Musbet steel.

2. And it is further agreed that when nails are made from old rails the basis shall be 16 cents scale price, and when any nail plate sheared are less than 10 inches in length the basis shall be 16 cents on a $2 card.

The following addenda is given:

1. Roughing down on bar, structural and 12-inch mills shall be paid at not less than 30 per cent. of rollers' wages.

2. Roughing up on bar, structural and 12-inch mills shall not be less than 40 per cent. of the price paid for catching on such mills.

3. All differences that may arise between the workmen and the mill owners shall be settled under the rules of the Amalgamated Association of the Iron and Steel Workers, as explained in Article X of the Constitution of 1889-'90.

This clause was offered by the manufacturers in conference and no objection was offered to it.

Tin-Plate Manufacturers' Meeting.

By Telegraph.

The regular monthly meeting of the Tinned-Plate Manufacturers' Association of the United States convened in the Hotel Anderson, Pittsburgh, this afternoon. While the attendance is not as large as at the meeting last month, the indications are that considerable business will be transacted and that the meeting will be a very successful one. About 30 firms are represented, and a large amount of correspondence from different localities regarding the manufacture of tin plates and the different kinds of machinery that will be used will be read by the secretary.

PERSONAL.

David Evans, general manager of Barrow Steel Company has been appointed general manager of Bolckow, Vaughan & Co., Middlesborough, England.

Alexander Cunninghame of Merry & Cunninghame, the Scotch Basic Steel makers, has gone to Europe for a brief trip.

H. R. Bishop was elected president of the Minnesota Iron Company.

V. T. Palmer, president of the Palmers and DeMooy Foundry Company, of Cleveland, sailed for Europe last week. He will be gone several months.

Pantobiblion is the name of a polyglot publication, with main office at St. Petersburgh, and published in this city by D. Appleton & Co. This monthly volume is, we believe, intended to be an international review of the world's scientific literature The first volume opens with a summary of the publications of the month, giving the names of scientific books, and, later on, reviews of several of them. The contents of several scientific periodicals are given also. The information is published in English, French, German and Russian. If the work of this journal be done with thoroughness the publication will prove useful to a certain class of students.

P. J. McArdle, who runs one of the largest junk yards in the world on his island below Albany, N. Y., has purchased 50 old locomotives from the New York Central and Hudson River Railroad for scrap iron.

The Consolidated Car-Heating Company, Albany, N. Y., will, some time during the current year, place on the market a new electric lighting system for railway cars. Each car will have an independent source of light, which will be available even when the car is at rest for five hours or longer. The tax upon the motive power will be slight and indirect, no steam being used. The designers are endeavoring to so simplify and cheapen the apparatus that it shall be, both in first cost and in running expense, more economical than any lights now used in first-class cars. The system will include storage batteries and a dynamo on each car, driven from the car axle.

The *Daily Pig*, devoted to pig iron interests, has commenced to root at Bessemer, Ala.

The Carnegie Co-operative Association at Braddock, Pa., has purchased a site of land in that place and will erect a business block on it. The cost of erecting the building will be paid by Andrew Carnegie.

MANUFACTURING.

Iron and Steel.

The lower mills of the Oliver Iron and Steel Company in Allegheny, Pa., at present contain 42 puddling furnaces, but it is the intention of the firm to add eight more to the equipment. The old Eagle Rolling Mill in Temperanceville, operated under lease by the above firm, is being remodeled, and its capacity considerably increased. Two heating furnaces have been rebuilt, each with double puddling furnaces, making in all 21 furnaces in the mill.

The plants of the Elba Iron Works and Continental Tube Works in Pittsburgh, recently purchased by the Oil Well Supply Company, Limited, of that city, are closed down at present while extensive repairs are being made. A new iron-clad building is to be erected over a portion of the rolling mill and a part of the tube works. The puddling department, which now contains 30 furnaces, is to be increased to 40, and a new department for the manufacture of coal gas is also being put up. Other additions are being made which will add considerably to the capacity of the plants.

The Otis Steel Company of Cleveland are busy repairing the damages caused by the fire in their mill. The company have recently completed the first of their reheating furnaces of exceptional size. The second is under construction, while the foundations are being prepared for the third.

A company has been formed at New Albany, Ind., with sufficient capital for operating the steam forge and rolling mill which recently suspended operations at that point. Operations will begin at once on a much larger scale than heretofore.

In our issue of last week we made mention of the fact that the Glasgow Iron Company, at Pottstown, Pa., were about to remove their entire plant to a point in the western part of that town, lying between the Philadelphia and Reading and Pennsylvania railroads. The principal works of this firm are now located on the Colebrookdale Railroad, a little more than a mile from the main line of the Philadelphia and Reading Railroad, and has no communication whatever with the Pennsylvania Railroad. The freight rate on the Colebrookdale Railroad which connects their place with the Philadelphia and Reading road has been so high that it resulted in the firm losing many orders when competing with their business rivals, whose plants are located on both the Philadelphia and Reading and Pennsylvania railroads. In some instances this excessive charge has amounted to five times as much as their competitors have paid for about the same mileage. After a very careful discussion of the matter, the Board of Directors decided that there was but one thing to do, and that was to remove the plant.

The two stacks of the Brier Hill Iron and Coal Company, Youngstown, Ohio, which have been idle since February last, were put in operation last week. This furnace plant is one of the most complete in every respect in the Mahoning Valley, and is under the immediate supervision of Jos. G. Butler, Jr., who is recognized as one of the best blast furnace managers in the country.

Lochiel Furnace, at Harrisburg, owned and operated by Robert H. Coleman, which has been out of blast for some time undergoing repairs, was put in operation last week.

The blast furnace of the Clinton Iron and Steel Company of Pittsburgh, which has been idle since March, was put in blast on the first day of the present month. The furnace has been rebuilt to some extent, which will add slightly to its capacity. At present it is turning out about 125 tons of mill iron per day.

The Himrod furnace plant, consisting of two stacks, at Youngstown, Ohio, operated under lease by S. Frank Eagle, but which has been idle for some time, will probably be purchased or leased by a prominent iron manufacturing concern of that city. Julian Kennedy, the well-known mechanical engineer, of Pittsburgh, inspected the plant last week, and it is understood that his visit was for the purpose of forming an estimate of how much it would cost to put the plant in complete running order. As yet nothing definite has been decided, but in all probability this plant, which has been idle for so long, will be put in operation at an early date. It is stated that an offer has been made for the plant, but the creditors of the concern have not accepted the figures, because they believed the plant should sell for more money, but it is understood that there is but a slight difference between the price offered and the one asked by the parties who now control the plant.

On Friday, the 12th inst., a charter was granted to the Allegheny Furnace Company of Pittsburgh, with a capital stock of $100,000. The following are the directors of the new company: David B. Oliver, H. W. Oliver, Jas. B. Oliver, G. E. Tener and C. D. Frazier. The above persons are identified with the Oliver Iron and Steel Company of Pittsburgh, which concern recently purchased the Edith blast furnace in Allegheny, and will put it in operation as soon as extensive repairs, now being made, are completed.

All opposition to the confirmation of the sale of the plant of the Pennsylvania Construction Company, at Uniontown, Pa., to Jno. A. Butz, was withdrawn last week in the Fayette County Court, and Mr. Butz is now in full possession of the property. In all probability the plant will be put in operation some time during the present month. The Pennsylvania Construction Company were an adjunct of the Columbia Iron and Steel Company, and were operated by that concern previous to their assignment about two months ago.

The Youngstown Iron and Steel Company of Youngstown, Ohio, are in receipt of a large order for cotton ties, which they are now filling and shipping as rapidly as possible.

A. & P. Roberts & Co. are building a large one-story iron and stone building at their Pencoyd Iron Works, near Philadelphia. The building will have a frontage on the river of 320 feet and a depth of 100 feet, and will be used as a steel blooming mill. The company's large five-story iron building, built for an office, engineering and other purposes, is completed and partially occupied. A large steam traveling crane is also being erected for conveying heavy girders and bridge material from the works to the cars.

Topton Furnace, Isaac Eckert, manager, Topton, Pa., has blown out for repairs. The furnace had been doing good work for a long time.

Operations on the buildings and furnaces of the Damascus Steel Works, to be erected at Denver, Col., are to begin as soon as a site is decided upon, which it is expected will be within a week. Work will be pushed and the plant will be producing before the end of the year.

It is reported that the Cleveland Rolling Mill Company of Cleveland have completed the plans for a new blast furnace.

The Bessemer City Mining and Mfg. Company have been organized and propose to build a new town at Whetstone Mountain, N. C., to be known as Bessemer City, and to erect iron furnaces and start other enterprises.

L. E. Bruns, recently appointed receiver for the Bessemer Rolling Mills Company, Bessemer, Ala., has been suspended as a receiver on complaint that he was a bondholder and vice-president of the company.

A remarkable feat in the way of quick repairs has been accomplished by the Findlay Rolling Mill Company of Findlay, Ohio. The muck mill building was destroyed and the machinery was damaged by fire on the 6th inst., and yet the necessary repairs were completed, temporary buildings erected, and the mill started full force on the 11th.

The Canonsburg Iron and Steel Company of Pittsburgh, manufacturers of fine sheet iron and sheet steel, and whose plant is located at Canonsburg, Pa., have recently decided to add an additional sheet mill to their equipment. They are now negotiating for the necessary machinery. Everything connected with the new mill will be of the most modern design, and when completed the capacity of their plant will be increased one third of the present amount.

The Etna Charcoal Furnace, owned by Hamiltons of Rome, Ga., will remain idle until first part of September.

It is reported that it is very doubtful whether the Langdon Charcoal Car-Wheel Iron Furnace will start up again for a long time.

It is stated that Geo. C. Hockstaff and others contemplate the erection of an iron furnace at Clinton, Tenn., 21 miles from Knoxville, Tenn., on the E. T., V. and G. Railroad.

The new charcoal furnace of the Rome Iron Company, Rome, Ga., L. S. Colyar president, of Chattanooga, Tenn., is running satisfactorily and to its full capacity. The product is said to be of first-class quality. This company have also recently established an American Pig Iron Storage Warrant Company yard at their plant, through which they intend to sell a large portion of their product.

Col. J. A. Montgomery, president of the Mary Lee Coal Company, Birmingham, Ala., has been appointed receiver of the Talladega Iron and Steel Company, Limited, of Talladega.

Ala , asked for by some of the attaching creditors. This is supposed to be only temporary, as the company are now endeavoring to float some $150,000 of the $300,000 bonds recently voted by the company, which will when accomplished not only liquidate their floating indebtedness, but give them a working capital. The late general manager, J. Lancaster, has returned to England, to be succeeded by a new manager.

The Chicago Horseshoe Company, whose works are at East Chicago, Ind., are reported to have sold out to New York capitalists. The plant comprises a Robert steel converter, a rolling mill and a number of horseshoe machines, which have been operated only a short time, although built some two years since. The new owners are to enlarge the works and put them in active operation.

F. A. Marriott, Richard Wooley, Jr., and E. J. Adams are the proprietors of the newly-formed Ivanhoe Rolling Mill and Iron Company, whose works are to be located at Ivanhoe, Ind , on the Michigan Central Railroad. The plant of the Western Iron Company in Kansas, near Kansas City, is to be removed to Ivanhoe. Over 1000 feet of side track have already been laid for the new company, and material for the buildings is already on the ground. The company have secured a tract of 40 acres for their works.

The East Lebanon Iron Company have been formed at East Lebanon, Pa., to erect a rolling mill at that place. The capital of the company is $100,000. N. E. Legat is president, and the remainder of the directory is composed of H. O. Nully, James E. Legat, J. R. Beckley, Daniel S. Light, J. B. Irish and H. T. Atkins.

The Woodstock Iron Company, Anniston, Ala., has established an American Pig Iron Storage Warrant Company's iron yard at their No. 1 and 2 charcoal furnaces, and is now delivering iron into warrant yards as rapidly as possible on orders.

The Phœnix Iron Works of Trenton, N. J., has received a contract for the erection of a boiler and engine for the Congressional Library at Washington.

The Brilliant Iron and Steel Company of Brilliant, Ohio, have commenced the work upon a new department to be located in the old nail factory. The old plate mill and a part of the nail factory will be torn out and two merchant bar mills erected in their places. The company have decided to abandon the manufacture of cut nails, and will change the plant into a sheet and bar mill.

Advices from Indianapolis, Ind., under date of June 1, state that Thos. S. Blair, Jr. of Pittsburgh, has brought suit in the United States Court against N. T. and C. W. DePau for $60,000 damages, alleging breach of contract for the construction of a steel plant.

The Cumberland and Unaka Iron and Steel Company have been organized at Knoxville, Tenn., and will erect a plant at once.

Machinery.

Frank C. Douds & Co., machinists and dealers in small supplies of all kinds, have recently purchased a site of land at New Castle, Pa., on which they propose erecting a strictly fire-proof machine shop, warehouse, engine and boiler room, offices, &c. The buildings will be of stone, brick and iron, and will probably be completed the latter part of this year.

A company has been incorporated at Jacksonville, Fla., under the style of the Acme Water Lift Company, to manufacture the Acme water lift and other machinery.

The King Iron Bridge Company of Cleveland, Ohio, have secured the contract for erecting a bridge at Oakbart, Ind., to cost $18,000.

The foundry of McKeown & Co., at Jefferson, Texas, has been burned at a loss of $20,000; insurance $6000.

Samuel W. Hay of Pittsburgh, agent for that city and vicinity for the Brightman Stoker Company of Cleveland, Ohio, has received an order for 16 stokers, to be placed in the new steel plant now being erected for the Watts Iron and Steel Company at Middlesborough Ky., by Jas. P. Witherow, engineer and contractor, of Pittsburgh. The boilers are 16 in number, each with two flues, and are 54 inches in diameter and 30 feet long, each boiler being equipped with one stoker. In addition to the above Mr. Hay has secured an order from the W. Dewees Wood Company of McKeesport, Pa., for two stokers, and is now figuring with several other concerns which will in all probability adopt this type of stoker.

The foundry of the Eli Crozier machine shops, at Kenneth Square, Pa., has been destroyed by fire, together with many of the patterns of the American Road Machine Company. The loss on the foundry is fully covered by insurance, but the loss to the Road Machine Company will be heavy.

At Battle Creek, Mich , the Battle Creek Machinery Company are increasing their plant by the erection of a building 40 x 50 feet as an addition to the present works.

The car works of the Billmeyer & Small Company, at York, Pa., are filling a contract for 14 open excursion cars for the Maracaibo Railway, in South America.

The Stanley Foundry, at Chippewa Falls, Wis., has successfully made its first cast.

The John E. Beggs Machinery and Supply Company have filed articles of incorporation at Paterson, N. J. The capital stock of the company is $25,000, of which $10,000 is paid in.

The old Gephart Foundry and Machine Shops at Cumberland, Md., have been leased by a Pittsburgh firm, who, it is reported, will manufacture electrical supplies.

Matthew Addy & Co., the large pipe-making firm of Cincinnati, Ohio, have leased the Anniston, Ala., Pipe Works.

The Hutchins Machine Company have been incorporated at Worcester, Mass., with a capital of $25,000.

The Caldwell-Wilcox Company, iron founders and steam engine builders at Newburg, N. Y., whose plant was destroyed by fire some time since, have begun operations on a new plant. The new foundry and machine shop will occupy the old site, and will have a frontage on the river of 175 feet and possess an average depth of 150 feet. The works will not only be much larger than the old ones, but will embody improvements and modifications which the old plant did not possess.

The Schenck Machine Works at Fishkill, N. Y., are reported as having been leased to Edward Green & Sons Company of Manchester, England, who are the original inventors and manufacturers of their fuel economizers for steam boilers.

The sale of the Kansas City, Mo., Radiator and Iron Foundry Works to B. C. Taylor, trustee, for $15,000 is reported. The operations of the works will be continued on an extended scale.

The Russellville Foundry and Machine Company have been organized by Luker & Smith of Russellville, Texas, who will erect and operate a plant.

Buckeye & Firestone, founders, at Florence, Md., have assigned.

The Wrought Iron Bridge Company at Canton, Ohio, have received a $35,000 contract for building a bridge at Great Falls, Mont.

The large shops of the Northern Pacific Railroad now in course of construction at Edison, near Tacoma, Wash., are rapidly approaching completion, and will be ready for work in September.

The new machine shop for the Ball & Wood Company, at Elizabethport, N. J , is fast approaching completion. The building is made of brick and iron, designed and built by the Berlin Iron Bridge Company of East Berlin, Conn., and will be used by the Ball & Wood Company for a machine shop. The central portion is 40 feet wide with a wing on each side 20 feet wide, the entire central portion of the building being served by a traveling crane driven by electricity.

The Trethewey Mfg. Company of Pittsburgh, have added to their equipment a large open-side planer 48 x 48 inches and 16 feet long. For very wide or overhanging work a carrier runs the whole length of the planer and at some distance from the bed. The carrier consists of a series of rollers connected and moving over an iron foundation, and on these rollers travels an I beam, which carries the projecting post of the work to be planed. Another addition which the firm has made is a grinding machine which will be run at a speed of about 1200 revolutions per minute. This machine is for grinding rolls, and will swing a roll up to 18 inches in diameter and 40 inches long. It was purchased principally for work on Government mint rolls, the grinding of which is necessarily very particular work.

The Lloyd Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, have received an order from the Willard, Sons & Bell Company, proprietors of the Chicago Steam Forge Works, at Chicago, for a No. 1 shear with two sets of knives, to be used for cutting car axles. They are also building for the Akron Iron Company of Akron, Ohio, an 18-inch bar mill. Last week they shipped to the Etna Iron Works, Limited, at New Castle, Pa., an 18-inch three-high bar mill, and have completed and ready for shipment a large lot of rolling mill machinery for the Goshen Rolling Mill Company, at Goshen, Va. In addition to the above, they are figuring on several other large contracts, and report business as being very brisk. Their entire plant is being operated full time, and their business so far this year has been much in excess of any previous year in their history.

The Weimer Machine Works Company of Lebanon, Pa., are building for F. C. Dinniny, Jr., of New York, for his furnace at Iron Gate, Va., a 46 inch steam cylinder, 90-inch air cylinder by 54-inch stroke blowing engine. They have shipped the Sloss Iron and Steel Company, Birmingham, Ala., three patent cinder cars, and one to the Vanderbilt Steel and Iron Company, Birmingham, Ala. They have lately shipped the Roanoke Iron Company, Roanoke, Va., Debardeleben Coal and Iron Company, Bessemer, Ala., Colorado Coal and Iron Company, Bessemer, Col., complete equipment of filling barrows for their furnaces. They have received an order from R. Heckscher & Sons, Swede Furnace, Pa., for a complete Weimer furnace top. Their water cooling buckets, lately placed on the boshes of No. 1 and 2 Alice Furnace at Birmingham, Ala., are giving good results. These furnaces are the first in the South to adopt the cooling device around boshes, and since their adoption several other furnaces in the Birmingham district are preparing to put them in use.

All departments of the Lodge-Davis Machine Company plant at Cincinnati, Ohio, are reported as being full of orders. At a recent meeting of the trustees of the Reform Farm at Lancaster, Ohio, the latter voted for the purchase of several thousands of dollars' worth of the Lodge-Davis Company's productions, consisting principally of shapers, planers, lathes, &c.

The additional buildings of the Henley Machine Tool Works, Richmond, Ind., which they have been compelled to erect on account of the increased demand for their specialty, the Shellenback pulley lathe, are now in course of construction, and will be completed at an early date.

Charles Hillman & Co., shipbuilders at Philadelphia, will add a two-story machine shop to their plant, 206 x 40 feet in dimensions.

Business men of Susquehanna, Pa., have decided to organize a stock company with a capital of $25,000, for the purpose of purchasing the Sperl plant and manufacturing steam heaters.

The new plant of the Springfield Foundry and Car Warks, at Springfield, Mo., now being erected on the site of the works recently burned, will be completed about July 1. The foundry will be 176 x 72 feet, one story high; the machine shop 92 x 50 feet, two stories high; the blacksmith shop 40 x 25 feet, and the pattern room 70 x 40 feet, two stories high.

L. Schutte & Co., engineers and machinists, of Philadelphia will soon begin work on a new plant at Twelfth and Thompson streets, that city. The building, which is to be a very artistic structure, will be six stories high exclusive of basement, and its cost is estimated at $90,000. The dimensions are 83 x 83 feet, and the material will be granite to the top of the second floor, above which terra cotta, brick and granite will be blended. The whole structure will be offset by a tower, the roof of which is to be of Spanish tile.

The Oneida Mfg. Chuck Co. of Oneida, N. Y., recently placed on the market the Little Hercules drill chuck. This chuck has three rotating jaws, pivoted at their ends. The jaws are of such form that they rotate eccentrically and the pressure of the work upon them tends to tighten the drill or tool within the jaws, making the chuck self gripping. The jaws are operated out and in to their work and their gripping is seconded by a screw and key wrench. The parts are few and simple, and are interchangeable. All sizes up to and including 1 inch hold every possible size of tool from their full capacity down. There is an unbroken bearing upon the drill shank the entire length of the jaw, and the larger the drill in use the more powerful the leverage and pressure of the jaws upon it. These points illustrate the superiority of this chuck.

The Walker Mfg. Company, Cleveland, Ohio, are erecting new works which are rapidly nearing completion. The machine shop will be 165 feet wide, divided into three bays by iron columns, spaced 24 feet centers longitudinally, two bays being 288 feet long each, and the third bay 430 feet long, with provision for extending all three bays to 500 feet each in length. Each bay will be provided with an improved 30-ton rope drive power traveling crane, and the shop will be equipped with the most modern tools and facilities for handling the heavy class of work which they are

making. Their foundry building is to be 118 feet wide by 300 feet long, equipped with two 30 ton, two 12 ton, and two 6 ton improved rope drive power traveling cranes, and all the latest improvements in foundry equipment. Their cranes will require about 2¼ miles of rope throughout the works to drive them. Their present foundry is 56 feet wide by 200 feet long, equipped with several lighter capacity cranes, which they will continue to use for lighter class of work. The buildings are all of brick, iron and glass, with ample provision for light.

The Lodge & Davis Machine Tool Company of Cincinnati, Ohio, having branch houses at New York, Pittsburgh, Chicago and St. Louis, have recently furnished a complete equipment of machine tools to the Lancaster Reform School of Lancaster, Ohio. This company have equipped several technical schools within the last year, all of whom are highly pleased with their tools.

A charter of incorporation has been granted to the R. D. Nuttall Company of Allegheny, Pa., with a capital stock of $125,000. The new concern will engage in the manufacture and sale of machinery of various kinds, and succeeds the old firm of R. D. Nuttall & Co.

William Tod & Co., machinists of Youngstown, Ohio, will soon complete the erection of a pair of 30 x 48 inch blooming mill engines for the open hearth basic steel plant of the Buena Vista Steel Company of Buena Vista, Va., of which Julian Kennedy of Pittsburgh is the consulting engineer. The engines will have hydraulic reversing valve gear, including a counter shaft 17 inches in diameter driven from the crank shaft by a pair of gear wheels of 20-inch face, weighing over 15 tons. The engines complete will weigh about 110 tons.

Hardware.

The American Improved Wrench Company, 30 Oliver street, Boston, Mass., who are putting Bornstein's Improved Patent Vise Wrench on the market, are offering for sale the State right to manufacture and sell the same.

At the edge tool works of Fayette C. Plumb, Frankford, Pa., business is under full headway in all the various departments, and with a larger number of hands than at any time during the history of this well-known concern. Mr. Plumb states that there was some falling off in orders during March and April, but since that date there has been such a steady influx that the works will be pretty well taxed to meet the demand during the balance of the year. The capacity is very large, however, and with the recent judicious additions to the working force the output will be greater than at any previous time.

At the Variety Iron Works, Frankford, Pa. (A. C. Rex & Co.), business is picking up very rapidly. Mr. Rex says that orders for their various specialties are already large enough to insure full employment for the works during the fall months, while judging from the inquiries that are being sent in the demand is only just beginning.

J. R. Clancy, Syracuse, N. Y., advises us that he is entirely remodeling his machine shop, adding another floor 23 x 67 feet, and has placed an order with Hill, Clark & Co. for a complete new line of machine tools.

Miscellaneous.

It is reported that a syndicate of New York, Philadelphia and Baltimore capitalists has been formed to purchase the franchise, equipment and privileges of the Baltimore City Passenger Railway Company. The purchase price is said to be in the neighborhood of $3,000,000. The company intend to put the cable system on three of the lines at a cost of from $5,000,000 to $10,000,000.

The Harlan & Hollingsworth Company have contracted to build two duplicate steel propeller steamers, each 310 feet long, for the Providence and Stonington Steamship Company for service on Long Island Sound. Both will be finished by May 1 next. They will cost in the neighborhood of $750,000 each.

The Clapp & Jones Mfg. Company of Hudson, N. Y., have put up a steam fire engine to be shipped to the City of Honululu in the Sandwich Islands.

James Ostrander & Son, proprietors of the Troy, N. Y., fire-brick works, have ceased to exist as a firm. The Ostrander Fire Brick Company, a stock concern, have succeeded them. This latter concern were incorporated under the laws of the State of New Jersey May 6, and the following officers were elected: President, F. A. Ostrander; secretary and treasurer, J. W. F. Podmore; directors, F. A. Ostrander, J. K. P. Pine, C. L. Alden, J. V. Selover and J. W. F. Podmore. The property both in Troy, N. Y., and in New Jersey, formerly belonging to James Ostrander & Son, has been transferred to the new company. Fire brick will still be manufactured in Troy, and a new plant will be constructed in New Jersey for the manufacture of fire brick for paving streets. The firm of James Ostrander & Son have been engaged in the manufacture of fire brick at Troy, N. Y., since 1848. Five of the largest round kilns in the world are constantly in operation at the works. In 1867 an extensive tract of land in the New Jersey fire-clay district was purchased, and from this the company obtain all of their raw material. James Ostrander died in 1875, and since Francis A. Ostrander has done business under the firm name. The manufacture of fire brick for paving material is not an experiment, and the company are assured of all the business they can do from the start. The new plant will be erected at Ostrander, N. J., on the Raritan River, near Perth Amboy.

The Harrisburg Boiler and Mfg. Company of Harrisburg, Pa., have recently filled an order for a 50 horse-power Star water-tube boiler to supply 4600 square feet of radiating surface for a church in Birmingham, Ala., and two of 45 horse-power for Cincinnati, Ohio, and one of same to Taladega, Ala.; also one in Cincinnati for the Eureka Heating and Ventilating Company for furnishing power for running fans, for Huyett & Smith's hot-blast heating system; also to Cincinnati, Ohio, one No. 2 Star water-tube boiler, for hot-water heating; capacity, 3000 square feet. They also recently shipped to Chicago one Star water-tube boiler for steam, 1800 feet, and one 3000, and one to Johnstown, Pa., 2500 feet. The United States Government also took two 60 horse-power boilers for use at Fortress Monroe, Va. These, with a number of smaller orders for various points, keep the establishment employed to full capacity.

Among recently authorized corporations in Illinois are the following: The Vienna Enamel and Stamping Company, Chicago, to manufacture and deal in stamped and enamel ware, &c.; capital stock, $100,000; incorporators, Max Koelling, John Koelling and Fred. W. Hersey. Pontiac Light, Power and Fuel Company, Pontiac, to build and operate electric light and gas works, &c.; capital stock, $16,000; incorporators, Benjamin D. Lucas, Charles L. Cappen, Henry D. Spencer and Henry A. Foster. Illinois Dishwasher Company, Chicago, to manufacture and deal in machines for washing fruits, vegetables and dishes; capital stock, $100,000; incorporators, William L. McCausland, Clarence C. Chapin and Hiram A. Haines. Corn Harvester Company, at Chicago; capital stock, $250,000; for manufacturing corn harvesting machinery; incorporators, Charles S. Young, Charles S. Harmon and John A. McKeever. Avery & Rouse Steam Thresher Company, Peoria, to manufacture agricultural implements; capital stock, $300,000; incorporators, Robert H. Avery, B. M. Avery, Harry G. Rouse and others. American Bicycle and Specialty Company, at Chicago; capital stock, $100,000; for manufacturing bicycles and bicycle wheels; incorporators, R. N. Simpson, George Johnson and H. Bowman. Sportsmen's Novelty Company, at Chicago; capital stock, $30,000; for the manufacture of sporting goods; incorporators, C. E. Felton, J. J. Grey and G. G. Felton.

It is reported in Chicago real estate circles that the Middleton Car Spring Company of Philadelphia closed a contract on the 9th inst., with the Harvey Land Association for the removal of their entire plant to Harvey, a suburb of Chicago. This company was organized with a capital stock of $100,000, and are one of largest car spring manufacturing concerns in the United States. The officers of the company are as follows: William J. Watson, president; Nathan Middleton of Philadelphia, vice-president, and James B. Quirk, secretary and treasurer. This company will occupy a tract of 8 acres north of 155th street and just west of Halsted street. This tract is just east of the land owned by the Buda Foundry and Mfg. Company and the Laughlin Mfg. Company. The Chicago Central and Grand Trunk railroads are on the northeast line of the tract, while the line connecting the Grand Trunk and the Illinois Central railroads will run through it from east to west. The Middleton Company will begin building operations at once, and will employ at least 300 men when the plant is built.

Ledig & Way of Philadelphia, who make a specialty of metal plates and fine bronze castings for car trimmings, bank fixtures and every purpose where metal ornamentation is used, have just made some handsome boiler plates to be used by the Edge Moor Iron Company on the Galloway boiler that will heat the Drexel Home, now in course of erection at Philadelphia.

The New Haven Steam Heating Company, New Haven, Conn., have become financially embarrassed, and have been placed in the hands of a receiver. The company's liabilities are said to be $40,000 and their assets $70,000. The failure was precipitated by the failure of H. C. Potter, an agent of the company, who was indebted to them for $5000.

The Edwin Bell & Sons Company of Youngstown, Ohio, manufacturers of nail kegs and hoop machinery, have decided to erect a cooper shop at New Castle, Pa., to make nail kegs for the New Castle Wire Nail Company of that place. At present they are looking up a suitable site, and expect to have the plant in operation not later than September next. They propose to put in the best and latest machinery used in the manufacture of nail kegs. They report trade as being very satisfactory for some time past.

It is announced that the Canadian Copper Mining Company have purchased a plot of 13 acres on the line of the Valley Railway, near Brooklyn, Ohio, and propose erecting a plant for the manufacture of a copper and nickel alloy from the copper matte which they import from their mines at Sudbury, Ont.

The Missouri Car and Foundry Company lost $20,000 by the burning of their shops in St. Louis June 12.

A two-story factory, 100 x 120 feet, has just been completed at Dallas, Texas, for O. K. Harry, who will manufacture iron roofing, fencing and wrought-iron work.

The Swenson patent system of evaporation is fully described in a catalogue issued by the Fort Scott Foundry and Machine Works Company of Fort Scott, Kan. In this system the heat introduced into the apparatus is utilized as many times over again as there are number of effects in operation. The steam is introduced into the tubes of the first effect, which evaporates about an equal quantity of water from the juice in this effect, and the vapor thus formed passes into the tubes of the second effect, where an equal evaporation takes place, and this vapor passes into the tubes of the third effect, and so on, indefinitely. The circulation of the vapor is maintained by carrying successively higher vacuums on each effect, so that the difference in the boiling points between the liquids in any two effects is about equal to the difference between the temperature of the steam introduced into the tubes of the first effect and the boiling liquid contained therein. This system is in use in some of the largest sugar refineries and plantations, where its work has been rapidly and economically done.

Among recently authorized corporations in Illinois are the following: The Kennedy Wire Nail Machine Company, Chicago, to manufacture wire nail and other machines; capital stock, $100,000; incorporators, John T. Kennedy, William C. Williams and Fred. L. Brooks. Allen Electric Bell Company, Chicago, to manufacture and sell door bells and other specialties; capital stock, $25,000; incorporators, R. A. Allen, S. W. Bonsall and G. F. Muller. Wing Nickel Works, Chicago; capital stock, $50,000; incorporators, Peter G. Wing, Daniel B. Wing and Hans Wing. American Fifth Wheel Company, Chicago, to manufacture and sell fifth wheels to wagons; capital stock, $35,000; incorporators, E. C. Hart, C. F. Hart and P. E. Cussey.

H. V. Partelow & Co. are to commence the manufacture of steam launches and small boats at Marblehead, Mass., the Dixey wharf property having been sold to them for this purpose.

The A. C. Evans Mfg. Company of Springfield have just closed their most successful season. The sales of cotton planters alone this year have been 2000, against 600 last year.

The firm of Iver Johnson & Co., extensive manufacturers of fire arms and bicycles at Worcester, Mass., have announced their intention of removing their plant to Fitchburg, Va. An effort will be made to induce the company to remain in Worcester.

The Cambridge Roofing Company of Cambridge, Ohio, has established a branch manufactory at Chattanooga, Tenn.

The Richmond Coal, Iron and Development Company have been incorporated at Richmond, Ky., to develop coal and iron mines. The authorized capital stock is $500,000.

A. M. Shook and S. H. Hillman, who have been in New York in the interest of the Southern Steel Company, who have been organized to erect a steel plant at Ensley City, near Birmingham, Ala., report that the preliminaries have been all arranged, and that work on the plant will be commenced soon. The Southern Steel Company are to be capitalized at $1,000,000, without bonds. So far about $600,000 has been subscribed.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., June 16, 1891.

Pig Iron.—The market has developed some irregularity since date of our last report, although on the whole there is nothing positively unfavorable, unless it may be in the somewhat unexpectedly large increase in the output of Pig Iron. Locally this ought not to have any immediate effect, as the furnaces are so closely sold up that there is a positive scarcity in certain favorite brands of Foundry Iron. Business has been brought to such a fine point, however, that it is impossible to have a firm market in one direction and a weak one at another, as values, like water, soon find their own level. An adjustment of quotations may or may not be necessary, but for the present there is a disposition among large buyers either to secure concessions from quoted rates or to defer placing orders until the situation is more fully developed. Small lots for immediate delivery are in good demand at full quoted rates, and as a matter of fact, the only feature that is less encouraging than on date of our last report is that large buyers are not so free in making bids as they were a little back. The usual midsummer suspension of work at most of the rolling mills is another reason for holding off, so that, on the whole, the dullness is neither unusual nor unexpected, and will probably give way to great activity later on. Meanwhile it is hoped that prices will not suffer materially, although as previously intimated a good deal will depend on the turn of affairs in the West and South, awaiting which, business in a limited sort of way is being done at prices about as follows, varying according to brand, point of delivery, &c.:

Ohio Softeners, No. 1x	$19.00	@	$19.50
Ohio Softeners, No. 2x	18.00	@	18.50
Standard Penna, No. 1x	17.75	@	18.00
Standard Penna, No. 2x	16.50	@	17.00
Medium Penna, No. 1x	17.25	@	17.50
Medium Penna, No. 2x	16.00	@	16.25
Virginia, No. 1x	16.75	@	17.50
Virginia, No. 2x	15.75	@	16.00
Standard Neutral All-Ore Forge	14.75	@	15.25
Ordinary Forge Cinder mixed	14.00	@	14.25
Hot Blast Charcoal	20.00	@	22.00
Cold Blast Charcoal	24.00	@	27.00

Muck Bars.—Business is not active, but holders are firm at from $27 to $27.50 delivered, or $26.50 to $27, f.o.b. cars sellers' mill. Consumers bought liberally some time ago, at lower prices, and seem indisposed to pay the advance until such times as they actually need material. Holders are very confident, however, and for the present seem inclined to take their chances of the future sooner than make concessions.

Steel Billets.—Market irregular and unsettled. Some concerns quote $27.75 @ $28.25 for Slabs and Billets, while others are said to be offering at $27.50 @ $27.75 for Philadelphia or Schuylkill Valley deliveries, and probably 50¢ less for the Susquehanna or similar points. The market is very irregular, however, and it is almost impossible to say what the exact figures are without making a firm offer. Latest reports are that the market is firmer, and that some mills have withdrawn their quotation, and in at least one intance to-day offers of $27.50 have been refused for Nail Slabs, Philadelphia delivery, so that it is likely that prices are again hardening.

Steel Rails.—Not much activity to report in this department. Mills are full of work for the present, however, and as the general outlook is improving there is reason to expect a corresponding movement in Rails. Prices are steady at $30, at mills, with no indication of anything but absolute firmness at the figure named.

Bar Iron.—Market fairly active, with a fair degree of firmness at prices recently quoted. There is a good general demand from most of the consuming interests, and manufacturers are disposed to take a sanguine view of the position, although prices are still very much below what they ought to be. In most cases 1.75¢ @ 1.85¢ is quoted for city deliveries, but at country mills 1.65¢ @ 1.70¢ appear to be the usual figures, although on some specifications still lower rates appear to be named occasionally. There is some talk of labor complications at points near by, but it is hard to believe that in times like these men will be so unwise as to divert to other markets what little business there is. In this connection we may state that the Logan Iron and Steel Company, at Lewistown, Pa., after ten weeks of idleness, were started Monday week with non-union men, and are turning out a very satisfactory amount of material.

Plates.—A continued good demand is reported in this department, especially for Boiler Plates, for which some very nice specifications have been put out. Mills have made liberal additions to their orders, and in view of the extremely hot weather and the near approach of midsummer, have probably all the business they can handle for several weeks to come. There is the usual talk of advancing prices, and although there is a better feeling and perhaps better prices in some instances, it would not be correct to say that there is any material or general improvement, although that is probably only a question of time. Meanwhile general quotations for lots delivered are about as follows:

	Iron.	Steel.
Tank Plates	2.00 @ 2.10¢	2.05 @ 2.30¢
Refined	2.20 @ 2.30¢	2.05 @ 2.10¢
Shell	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange	3.20 @ 3.30¢	2.50 @ 2.75¢
Fire-Box	4.00 @ 4.25¢	3.00 @ 3.50¢

Structural Material.—The demand is improving, and mills are fully employed in meeting calls for small lots, which, in addition to their old orders, keeps them quite busy. A great deal of new business is developing, and prospects are considered to be very encouraging. Prices about as follows (delivered: Angles, 2.05¢ @ 2.10¢; Sheared Plates, 2¢ @ 2.10¢, and 10¢ @ 15¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—Mills have been somewhat pushed to keep up with the demand, and the second half of the year will commence with a satisfactory amount of orders on hand, while the current demand promises to be very active. Prices for best makes about as follows:

Best Refined, Nos. 14 to 20.....3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....3.10¢ @ .....
Best Refined, Nos. 25 to 26.....3.20¢ @ 3.30¢
Best Refined, No. 27.....3.40¢ @ .....
Best Refined, No. 28.....3.50¢ @ .....
Common, ¼¢ less than the above.
Best Soft Steel, Nos. 14 to 20 .....3¢ @ 3¼¢
Best Soft Steel, Nos. 21 to 24.....3¼¢ @ ....
Best Soft Steel, Nos. 25 to 26.....4¢ @ ....
Best Soft Steel, Nos. 27 to 28.....4¢ @ ....
Best Bloom Sheets, ¼¢ extra over the above prices.
Best Bloom, Galvanized, discount.... @ 67½ %
Common, discount..... @ 70 %

Old Rails.—There is so little doing in Iron Rails that they are hardly worth quoting, especially as there is no regular demand and prices liable to change with every transaction. About $21 @ $21.50 at tide, or $22 @ $22.50 at interior points, would be quoted for Iron and probably $17 @ $18 for Steel, according to point of delivery.

Scrap Iron.—Prices hard to quote except in general terms. Any pressure to sell would weaken prices at once, while an order to fill actual needs might not be placed at much, if anything, below quoted rates, which are about as follows: No. 1 Railroad Scrap, $20.50 @ $21, Philadelphia, or for deliveries at mills, in the interior $21 @ $22, according to distance and quality; $15 @ $16 for No. 2 Light; $14 @ $15 for best Machinery Scrap; $13 @ $14 for ordinary; $15 @ $16 for Wrought Turnings; $10 @ $10.50 for Cast Borings, and nominally $24 @ $25 for Old Fish Plates, and $16 @ $17, delivered, for Old Car Wheels.

Wrought Iron Pipe.—Demand active and prices fairly maintained, although close buyers manage to get extra discounts on certain kinds of business. Ordinarily, however, discounts are about as follows:

Butt-Welded Black.....55 %
Butt-Welded Galvanized .....45 %
Lap-Welded Black.....65 %
Lap-Welded Galvanized.....52½ %
Boiler Tubes, 2½ inch and under.....55 %
Boiler Tubes, 2¾ inch and larger.....60 %

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, June 17, 1891.

It had been confidently expected that Chicago would be free from building trades labor troubles this season, but it seems impossible to get along without them. A stubborn contest was inaugurated on Monday between the architectural iron manufacturers and their workmen which has stopped all progress on partly completed Steel structures and checked the beginning of new ones. There is much activity in this line, and a long struggle will seriously affect many branches of business depending upon building interests. General trade shows no improvement, but a ray of light comes from the car builders, who report increasing inquiries from railroads and a good prospect of a heavy demand for cars in the next 30 days.

Bar Iron.—The most important occurrence of the last week was the placing of large season contracts by Davenport and Moline parties. Prices have not been made public, but the successful bidders must have made very low figures. Indiana mills took this business. A car works in this vicinity received an order for 500 freight cars, but up to a day or two since had not purchased the Iron for them, having fixed a price below the views of manufacturers. Railroad purchasing agents are inclined to follow the example of the agricultural implement people in placing season contracts for Bar Iron, and one important road is now asking for bids on that basis. Aside from those occurrences the market has been rather flat. The local mills ask 1.65¢ @ 1.70¢, half extras, and the valley mills 1.55¢ at Youngstown. Jobbers are still favored with an active demand from stock, and quote 1.75¢ @ 1.80¢, full extras.

Pig Iron.—A few sales of 500 to 700 tons of Southern Coke Iron have been made for delivery through the year, but not much is doing in a large way. Small orders are more numerous, however, and a better feeling is again growing. Reports are current of weakness among Southern furnace companies, but diligent inquiry fails to discover any important lowering of prices among them. Most agents are being held firmly to old quotations by their principals, and cannot reduce their prices or make even small concessions. The situation is strengthened by the position of Northern Coke Irons, which are not now pressed for sale. Leading makers are well sold up for months to come, and the others are being called upon to help consumers out who are not getting their Iron as fast

as contracts specify. Prominent dealers express the belief that it would require but a slight increase in the consumption of Iron to cause prices to advance. The situation in Lake Superior Charcoal has not changed. Sellers are still found who are ready to take contracts at $17 or very close thereto. It is estimated that the Malleable Iron works of the country have now bought upward of 70,000 tons of Charcoal Iron and still they have not covered all their requirements. Inquiries are coming in not only from Malleable foundries, but also from Car-Wheel makers, who are evidently realizing that it is about time for them to begin to contract for the season's supply. We quote for cash, f.o.b. Chicago:

Lake Superior Charcoal	$17.00 @ $18.00
Local Coke Foundry, No. 1	15.50 @ 16.00
Local Coke Foundry, No. 2	15.00 @ 15.50
Local Coke Foundry, No. 3	14.50 @ 15.00
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	18.00 @ 18.50
Southern Coke, No. 1	16.00 @ 16.50
Southern Coke, No. 2	15.25 @ 15.75
Southern Coke, No. 3	14.50 @ 15.00
Southern, No. 1, Soft	15.25 @ 15.75
Southern, No. 2, Soft	14.00 @ 14.50
Southern Gray Forge	14.00 @ 14.50
Tennessee Charcoal, No 1	18.00 @
Alabama Car Wheel	22.50 @ 23.50
Coke Bessemer	17.50 @ 18.00
Hocking Valley, No. 1	17.00 @ 18.50

Structural Iron.—The past week was a period of very good trade, although no very large buildings were in the list of those placed under contract. Apart from the building trade, the demand for Structural material has not been heavy. Bridge building is not active, the works running mainly on repairs, roof trusses, &c., for which orders are small, taking a great many of them to cover much material in the matter of tonnage. Dealers in Structural Iron are but little disturbed by the strike referred to, as they think it must be of short duration.

Plates.—Business is mainly confined to store trade, which is fairly active, and a few good mill orders have been taken, among them one of 200 tons for New Orleans. Prices are running along quite evenly.

Sheets.—Nothing new has developed in Black Sheets from the manufacturers' standpoint. Best makes command 2.85¢ @ 2.90¢, at mill, for No. 27. Jobbers' prices are not so large as they were, and while 3.30¢ continues to be quoted, it is possible to purchase from some houses at 10¢ per hundred lower.

Galvanized Iron.—In fair but not heavy demand. Agents for favorite makes report mill shipments falling behind, but the general supply is abundant enough to keep prices very low. Juniata is still quoted 65 % off, but concessions are being made to best buyers.

Merchant Steel.—Large season contracts have been placed by Davenport and Moline consumers for Bar and Shaped Steel. The successful bidders are from the southern part of this State, and are new competitors in the field. The prices made are understood to have been quite low. The usual carload trade shows no change on any grade of Steel: 2.30¢ for Machinery Steel, 2.40¢ for Open-Hearth Spring, 2.30¢ for Tire and 2¢ for Bessemer Bars, all from good stock. Tool Steel sells at 7¢ @ 7½¢ and upward, according to quality.

Track Supplies.—Steel Rails are selling in lots of 1000 to 3000 tons, running up to a respectable aggregate weekly, but large orders are still held back. Inquiries are steadily increasing, and sellers believe that the time is now rapidly approaching when a large trade must be done. Quotations are maintained for largest lots. Fastenings are quoted as before, viz: Iron Splice Bars, 1.85¢ @ 1.90¢; Spikes, 2¢ @ 2.10¢; Track Bolts with Hexagon Nuts, 2.80¢ @ 2.90¢.

Old Rails and Wheels.—The only sale of Old Iron Rails reported is one of 750 tons at $23, Chicago. Several other lots are offered but the holders are not anxious to part with them and want full prices. Old Steel Rails are quiet at $14.50 @ $17, according to length. Old Car Wheels show signs of some movement after a long period of inactivity. They are available at $16 for large lots up to $17 for carloads.

Scrap.—A much better demand has sprung up for Wrought, and one sale of Railroad Scrap of about 500 tons was made at $19.75, delivered to buyer's mill, not far from this locality. Sales are also reported of Cast Scrap and Steel. Offers of Eastern Scrap are being made to consumers here, and Country Scrap is also a little more plentiful. We quote as follows, per ton of 2000 pounds: No. 1 Railroad, $19; No. 1 Forge, $18.50; No. 1 Mill, $14; Fish Plates, $21; Axles, $23; Pipes and Flues, $13; Horseshoes, $18; Cast Borings, $8; Wrought Turnings, $11.50; Axle Turnings, $13; Machinery Cast, $12.50; Stove Plates, $8.50 @ $9; Mixed Steel, $11; Coil Steel, $15; Leaf, $16; Tires, $16.50.

Metals.—The situation in Copper is very strong. The advanced prices are maintained, and the outlook is very promising for their continuance. Lake is quoted at 13¢, and casting brands 12½¢, quarter carload lots. Spelter stands about as it did last week, prime Western being quoted at 4.90¢, with fewer sellers. Trade in Pig Lead has been quiet during the week, although some 600 tons sold at 4.30¢ @ 4.40¢ July delivery, principally Desilverized. Latterly, however, the market showed some signs of weakness in values caused by offerings from St. Louis, and 100 tons sold at 4.30¢, spot. There is no anxiety on the part of the several refiners to sell Lead, the opinion gaining ground that the next 60 days will see higher values in the West.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, June 17, 1891.

Pig Iron.—The general tone of the market has been an easy one all around, and while there has been a fair volume of business the past week for a dull time, it has been mainly in small lots of 2000 tons or less, but the aggregate is of satisfactory proportions. There have been no sales reported of Gray Forge Iron for less than $10 at the furnace, but the fact that offers to sell at this price meet with the refusal of buyers, accompanied by the remark that the price is too high, leads to the presumption that this price has been shaded by some furnaces. There are ample offerings for deliveries running from July to the end of the year, with considerable sales at this rate. Neutral Forge is more freely offered, and is ruling 25¢ lower. There has been some inquiry for Standard Southern Car-Wheel Iron, with sales at slightly reduced prices, while other than standard brands are offered at lower prices, and meet with success. The small quantity of Hanging Rock Cold-Blast Iron available is held at higher prices, but there is little demand for it. The consumptive side of the market has developed no new feature of interest. There is a general belief that there will be an increase in the consumption of Iron by the railroad repair shops after July 1, as their purchases of Car-Wheel Iron might seem to suggest, but the latter are not large enough to make much impression, and there are as yet no indications of a general resumption of work. There is much complaint of the backwardness of collections, and there is no doubt that there is enough stringency in the money market to greatly retard a free movement in Pig Iron. We quote prices as follows:

Foundry.	
Southern Coke, No. 1	$14.75 @ $15.00
Southern Coke, No. 2	13.75 @ 14.00
Southern Coke, No. 3	13.25 @ 13.50
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	20.00 @ 21.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.00 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.00 @ 16.00
Forge.	
Gray Forge	12.75 @ 13.00
Mottled Neutral Coke	12.25 @ 12.50
Car Wheel and Malleable Irons.	
Southern Car Wheel	19.25 @ 19.75
Hanging Rock, Cold Blast	25.00 @ 26.00
Lake Superior Car Wheel and Malleable	18.00 @ 18.50

Louisville.

LOUISVILLE, KY., June 15, 1891.

Pig Iron.—The market continued dull during the first part of the week, but toward the close inquiries were more numerous and resulted in some sales. Rolling mills report that there is an increased inquiry for Iron, and that parties who have been trying to purchase at other points finished material at the exceedingly low prices that have prevailed have found it not easily done. All have been disappointed that the buying on the part of railroad companies has not developed, which it was felt would be brought about as soon as there were assurances that the crop would be all right. Same is far enough advanced at the present time to justify the belief that nothing can now check a large harvest, and under ordinary circumstances the buying at the present moment should be heavy. The only reason offered for the slackness of orders from railroads now that they have such heavy tonnage promised is that they have not the money to pay for cars at the present time, owing to the heavy decline in railroad securities. Iron is being offered at basis of $10 for Gray Forge, both for immediate and for delivery throughout the year. Though the leading companies are asking 25¢ more, there seems to be plenty of cheap Iron to supply present needs. We quote for cash, f.o.b. cars Louisville, Ky.:

Southern Coke, No. 1 Foundry	$14.50 @ $15.00
Southern Coke, No. 2 Foundry	13.75 @ 14.25
Southern Coke, No. 3 Foundry	13.25 @ 13.75
Southern Coke, Gray Forge	12.75 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel	17.00 @ 20.00

Detroit.

WILLIAM F. JARVIS & CO., Detroit, Mich., under date June 15, say: While nearly every branch of the Iron business looks decidedly brighter and more brisk in every direction, we still have to report no actual change in figures. The purchasing of Ore, the termination of the Coke strike, the inquiry for cars, all lead to a large inquiry for Pig Iron, and some actual transactions of considerable magnitude, particularly for Lake Superior Charcoal Iron for car wheel purposes, have been made. There were several thousand tons of Wheel Iron placed in this market during the present week at no advance in figures, however, and there were also a number of orders for Iron for malleable use entered, for delivery during the season of navigation. It does not seem at all improbable that advances may be made for this grade of Iron almost any time, inasmuch as the large inquiry seems to continue, also with the brighter general outlook noted, and with very much smaller stocks left in the hands of makers. Southern Iron remains at the old figures, with transactions of the ordinary kind, but no large ones made here during the past

week. Northern Coke Iron makers are feeling into this market and are offering metal at fair figures for delivery up to the close of the year. The market is quotable as follows:

Lake Superior Charcoal, all numbers	$18.00 @ $18.50
Lake Superior Coke, Bessemer	18.00 @ 18.50
Ohio Blackband (40 per cent.)	18.00 @ 18.25
Lake Superior Coke Foundry, all ore	18.00 @ 18.50
Southern No. 1	16.25 @ 16.50
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery	18.00 @ 18.50

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, June 16, 1891.

Pig Iron.—There has been considerable inquiry for Bessemer Iron the past week for immediate or nearby delivery, and being in scant supply, we have to report a more active and firmer market, with sales reported at an advance of 25¢ @ 50¢ ₱ ton. For later deliveries, however, the market remains unchanged, some sales having been made at $15.75 @ $15.85, whereas for June or July there does not appear to be much difficulty in getting $16.25. Some large sales were reported at $16 50 and $16.60, but they could not be traced to any reliable source, and consequently were regarded as fishy, having been, it is believed, put out for a purpose. In regard to Forge Iron, the situation remains unchanged; city furnaces are still supplying city consumers with about all they want at $14, cash, delivered, which is equal to $13.75 @ $13.85 at furnace. There is little or no valley Iron being sold in this market, as valley furnacemen are able to get about Pittsburgh prices, $13.75 @ $13.90, at home. The Girard Furnace Company report sales of 8500 tons to valley consumers to go to Wheeling and elsewhere for June, July and August delivery, all at $13.90 at furnace, which at 70¢ freight would be equal to $14.60, Pittsburgh; but, as already intimated, there was none of it sold to come here. It is not to be supposed that consumers here will pay any such prices for valley Irons as long as they can buy city Iron at $14. Production is being increased in the valley district by the starting up of additional furnaces; but, as already stated, stocks are small, and nearly all the furnaces in blast are sold up. We quote prices as follows:

Neutral Gray Forge	$13.75 @ $14.00,	cash
White and Mottled	13.50 @ 13.75,	"
All-Ore Mill Iron	14.50 @ 15.00,	"
No. 1 Foundry	16.50 @ 17.00,	"
No. 2 Foundry	15.50 @ 16.00	"
No. 3 Foundry	14.75 @ 15.00,	"
No. 2 Charcoal Foundry	21.00 @ 21.50,	"
No. 1 Charcoal Foundry	22.00 @ 22.50,	"
Cold-Blast Charcoal	25.00 @ 27.00,	"
Bessemer Iron	16.00 @ 16.25,	"

Muck Bar.—The hot weather has created more inquiry, but prices remain unchanged at $26.25 @ $26.50. But few of the mills here are willing to sell below $26.50. Most of the Muck sold in this market is made elsewhere, principally in the Wheeling district, and the mills there are pretty well sold ahead.

Manganese.—The Carnegie furnaces are able to supply the demand here with domestic, and there has been but little foreign sold here for some months past. Sales of 80 % domestic at $66.50.

Manufactured Iron.—There is an increasing demand, mills generally pretty fully employed, and if the present intensely hot weather continues the output will be considerably curtailed, as the puddlers as well as the rollers will not be able to work very long at a time. Prices remain as last quoted: Bars, 1.65¢ @ 1.70¢; Plate and Tank, 2.10¢ @ 2.15¢; No. 24 Sheet, 2.75¢ @ 2.80¢, 60 days, 2 % off for cash; Skelp Iron, 1.62½¢ @ 1.65¢ for Grooved, and 1.85¢ @ 1.90¢ for Sheared, 4 months, 2 % off for cash. There is a very fair demand for Skelp, but manufacturers complain of prices as being unremunerative. The mills out in the Shenango and Mahoning valleys are pretty well sold up and the market out there is reported firmer. One of our brokers, who does a great deal of business in the district named, says the best he is able to do is 1.55¢ @ 1.60¢ for Bars; he says he would have placed orders for some 3000 tons at 1.50¢ rates, but was unable to find any one out there willing to sell below 1.55¢. The mills out there are pretty well filled up with orders, and consequently are in a position to command better prices.

Structural Material.—There is an increasing demand, particularly from the West, and there is a better feeling in consequence. The World's Fair structures at Chicago will require a great deal of material in this line, and already there are plans and specifications on the market asking for bids. There is reason to believe that the carpenters' strike will be brought to a close soon, and if so this, too, will cause an improved demand for Structural material of all kinds. Prices remain unchanged: Channels and Beams, 3.10¢; Angles, 2¢; Steel Sheared Bridge Plates, 2.10¢ @ 2.15¢; Universal Mill Plates, Iron, 2.05¢; Tees, 2.60¢; Refined Bars, 1.80¢ @ 1.90¢.

Steel Plate.—There has been little new business placed here of late, but the mills have about all they can do in working up old contracts. No change in prices: Tank, 2.10¢; Shell, 2.45¢; Flange, 2.65¢; Fire-Box, 3.90¢ @ 4.25¢.

Merchant Steel.—There is a fair business. Prices unchanged: Bessemer Tool Steel, 7¢ @ 7½¢; do., Spring, 2½¢; do., Machinery, 2.40¢ @ 2.50¢; do., Toe Calk, 2½¢; Tire Steel, 2.20¢; Steel Bars, 1.90¢, full extras; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢.

Barb Wire.—There is nothing new to note, with the exception that some manufacturers are, it is said, becoming more anxious, having gotten through with former contracts Prices unchanged, as follows: Glidden Painted, $2.85; do. Galvanized, $3.40; Four-Point Painted, $2.80; do. Galvanized, $3.30, in car lots f.o.b. at maker's works.

Wire Rods—Continue dull and prices are weakening. We quote domestic at $36 @ $36.50 on cars at makers' works.

Nails.—There is no improvement to report in the Cut Nail trade. Business continues light, while prices remain unchanged at $1.55 @ $1.60, f.o.b at factory, 60 days, 2 % off for cash, according to delivery, specifications, &c. The labor troubles have hurt the Nail trade. Wire Nails continue dull, and while some manufacturers are indifferent about business at present prices others are soliciting orders. A good deal depends upon how manufacturers are situated. While some few sales were made as low as $1.87½, f.o.b. at factory, 60 days, 2 % off for cash, there are now, so far as we can learn, no sellers under $1.90, which may be regarded as the ruling price.

Wrought Iron Pipe.—There has been nothing new or important developed during the past week. Prices remain unchanged. Discounts on Black Butt, 55 %; on Galvanized do., 45 %; on Black Lap, 65 %; on Galvanized do., 52½ %. Boiler Tubes, all sizes up to 2½-inch, 55 %; 3 to 6-inch, inclusive, 65 %, 7-inch and upward, 55 %; Casing, all sizes, 55 %.

Billets and Slabs.—There have been some sales reported during the week as low as $25, f.o.b., at mill but makers generally quote at $25.50 @ $26. One of our largest manufacturers quoted within past day or two at $26 for an order for 3000 tons. The order for 10,000 tons referred to last week has not yet been placed, the buyer refusing to meet the price demanded. The mill at Duquesne, owned by Carnegie & Co., which for a time was at work on Rails, is still making Billets.

Railway Track Supplies.—There is a very fair and increasing demand, but no change in prices. Spikes, $2.05, 30 days, f.o.b. at makers' works; Splice Bars, 1.80¢ @ 1.90¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Old Rails.—There has been rather more doing in Iron Rails during the past week, but prices show no improvement, ranging from $22.50 to $23. Old Steel Rails in fair demand, with sales at $17 @ $17.50 for short and $18 @ $18.50 for long pieces.

Scrap Material.—Sales of No. 1 Railroad Wrought Scrap at $19 @ $19.50, net ton; Iron Axles, $25 @ $26; No. 1 Railroad Cast Scrap, $13.50 @ $14, gross; Old Car Wheels, $16 @ $16.50; Sales of Steel Rail and Bloom Ends at $16.50 @ $17.

Connellsville Coke.—There is an increasing demand, but no change in prices. Blast Furnace Coke, $1.90; Foundry Coke, $2.30; Crushed Coke, $2.65—all per ton of 2000 lb on cars at ovens.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, June 15, 1891.

Pig Iron.—The market shows comparatively little change from last week. It has improved somewhat in spots, but there continues to be sales made at what is known as "cut rates," and until this feature is eliminated any general improvement is out of the question. Sales are of moderate quantities, although occasionally a consumer is found who thinks $11.25 for No. 2 Foundry, and $10 for Gray Forge, at the furnace, is cheap, and in such cases sales are somewhat larger. These are few and far between, and furnacemen are either compelled to shade prices, or accept orders for car loads and 100-ton lots. The opinion is freely expressed that better times are coming as soon as the crops are assured, which is reasonably certain, as indications point to larger crops than the country has seen for years. In the meantime, however, there is nothing to hold the market, and consumers who are looking for bargains will doubtless be able to find them during the next 30 days. It would be well, however, not to delay purchases too long, for once the market turns it is quite likely to keep improving during the balance of the year. During the week under review sales have been light, at about the following prices which are quoted for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry	$15.75 @ $16.00
Southern Coke, No. 2 Foundry	14.50 @ 14 75
Southern Coke, No. 3 Foundry	14.00 @ 14.25
Gray Forge	13.25 @ 13.50
Southern Charcoal, No. 1 Foundry	17.50 @ 18.00
Southern Charcoal, No. 2 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	15.00 @ 15.50
Ohio Softeners	18.25 @ 19.50

Bar Iron.—Mills report a fairly active trade, and are not disposed to worry about the future, being satisfied with orders that are sufficient to run their mills, say, from 30 to 60 days ahead. Beyond this time they are not anxious to sell, anticipating higher prices shortly after the month of July is over. Car works are holding off their orders longer than was expected, but they will be heard from shortly. Prices are fairly well maintained, and, except when figuring on large orders, the following quotations rule: Lots from mill command

1.70¢ @ 1.75¢, delivered on cars at East St. Louis. Small lots from store are quoted at 1.82½¢ @ 1.87½¢.

Barb Wire.—The demand keeps up remarkably well, and jobbers and mills alike are receiving their share of the trade. There is some talk of lower prices having been made than those quoted below, but diligent inquiry fails to substantiate this rumor. Mills claim they are refusing to shade prices, and state that if any cutting is done it is by the jobbers. We quote as follows: Painted, 2.95¢; Galvanized, 3.50¢; carload lots 10¢ ₱ cwt. less than these prices.

Wire Nails.—The refusal of local mills to meet the extremely low prices made by outside factories has affected trade to some extent. There is, however, a feeling prevalent that these prices cannot last long, and with any kind of an early fall trade the chances for a decided improvement in values is quite probable. We quote as follows: Carload lots from mill command $2.10 @ $2.15, f.o.b. cars, St. Louis.

(*By Telegraph.*)

The demand for Pig Lead was very strong yesterday and to-day, and offerings are scarce at 4.32½¢; bids of 4.27½¢ are freely made, but 4.30¢ is the lowest sellers will accept. The prospect for higher prices is considered encouraging. The Spelter market, in sympathy with Pig Lead, is strong; offerings are made at 4.75¢, although 4.72½¢ for round lots would most likely be accepted. Consumption keeps up, and any surplus stock of Spelter seems improbable.

Cleveland.

CLEVELAND, June 15, 1891.

Iron Ore.—Considerable new Ore has been sold during the past week, and the high-grade Bessemers have been well disposed of at figures approximating $5.50. Non-Bessemers are being rapidly cleared up at $3.50 @ $4, and Gogebic and Menominee Bessemers are being taken at $4.25 @ $4.50, lower lake ports. The Ore handlers' strike was practically settled to-day, after a long controversy that the Ore men felt in no hurry to terminate. The Ore handlers could scarcely have selected a more unfortunate time to throw down their shovels. The docks were stocked mountain high with old Ore, which was being forwarded to the furnaces in driblets only, and there existed no demand whatever for new Ore. While the strike was on the vessels originally consigned to Cleveland went on to Fairport or Ashtabula to discharge their cargoes. The handlers asked for 13¢ for unloading vessels, with a foreman when there was a gang of 22 men, or 12¢ when there were 21 men, excluding the foreman; or, if a foreman was necessary, have him perform his share of the manual labor in addition to his other duties. Something very like this has been granted. Quotations for new Ore are:

No. 1 Specular and Magnetic Ores, Bessemer quality	$5.25 @ $5.50
No. 1 Specular and Magnetic Ores, non-Bessemer quality	4.25 @ 4.50
Gogebic Ore, Bessemer quality	4.25 @ 4.50
Menominee Ore, Bessemer quality	4.25 @ 4.50
Menominee Ore, non-Bessemer quality	3.40 @ 3.60

Sales for the past week will aggregate 250,000 tons, bringing the total transactions to date up to about 3,000,000 tons. Prices are unchanged, at an average reduction of $1.25 per ton over last season's quotations. Charters reported to day are on the basis of 55¢, Escanaba to lower lake ports.

Pig Iron.—Two or three local furnaces have renewed operations during the past week and business is generally more satisfactory. The market is certainly firmer, with prices slightly advanced from last week. Production seems considerably larger than for several weeks' past, but the demand keeps pace with the output. The few sales reported are at prices giving no criterion whatever of the market.

Old Rails.—The market is by no means active The few sales that are reported have been at about $22.50 @ $23.

Manufactured Iron.—The mills seem busy enough, although the market is rather slow. Sales of Common Bar at 1.60¢ @ 1.65¢ are announced.

Scrap.—The market is stronger and the demand is much improved, on a basis of $19.50 for No. 1 Wrought and $12 for Wrought Turnings.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, June 17, 1891.

American Pig.—Sales agents agree in reporting the local Pig Iron market as being very quiet. Northern furnacemen generally are reported to be holding stiffly at quotations. There has been a little more doing in Southern Iron, and there has been some inquiry for Charcoal brands. Northern brands are quoted at $16.75 @ $18 for No. 1; $16 @ $16.50 for No. 2, and $14 @ $14.50 for Gray Forge. Southern Irons sell at $16.25 @ $17.25 for No. 1; $15.50 @ $16.25 for No. 2; $15.75 @ $16.50 for No. 1 Soft, and $14 @ $14.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—No movement whatever is reported in Spiegeleisen, and the demand for Ferromanganese is moderate, with quotations unchanged at $64 @ $65 for 80 %.

Billets and Rods.—From Pittsburgh comes the report of pretty heavy transactions during the last few days in domestic Wire Rods at $36 and upward. The Eastern market is quiet, on the basis of $38 for Rods. Very little business is reported in Billets.

Steel Rails.—What few orders come into the market are on requisitions from division superintendents and rarely exceed 2000 tons at a time, even with the large trunk lines. Buyers show no interest in the market, being apparently convinced that they have nothing to lose by waiting, since they will probably be able to purchase their track material at current prices later on. Reports from railroad managers indicate that as soon as they have become convinced that a large tonnage must be hauled for the new crops they will be in a position to buy more liberally for repairs. How light the production has been thus far this year is indicated by the report of the Board of Control. The mills in the association, which include all, with the exception of the Colorado works, a small concern relatively, shipped in the aggregate up to June 1 337,265 gross tons of standard rails. The orders booked up to June 1 figure up 725,376 tons. During May the shipments were 110,000 tons, at which rate it would take more than three months to work off present orders. The indications, however, are that the mills will run fuller in the near future. Last year the deliveries of the mills up to June 1 were 598,000 tons, exclusive of the Allegheny Bessemer and the Colorado, while the sales footed up to 1,086,000 tons. This year is, therefore, far behind the record of 1890, so that unless there is a very decided change in the market in the next few months the total shipments of steel rails of standard sections from works in the association are not likely to exceed 1,400,000 tons. If we reach this figure the mills will be forced to produce in the second half at a rate more than double of that of the first six months. From present indications the shipments of Standard Rails will not be much more than 450,000 gross tons by July 1. These indications have considerable bearing on the Pig Iron consumption during the second half of the year. Even at a moderate estimate of 1,400,000 tons of Rails the consumption of Bessemer Pig for that industry must rise to about 1,000,000 tons in the second half, as compared with barely 500,000 tons in the first half year. From the West come reports of somewhat more rapid buying in Bessemer Pig during the past few days. Reports in the trade have it that at the last meeting between the Coke interest and the Valley furnacemen a leading Coke producer offered to take 30,000 tons of Bessemer Pig at $16, and that this offer had been accepted in a number of cases. Quotations remain $30.75 @ $31 at tidewater.

Rail Fastenings.—We continue to quote Fish Plates 1.70¢ @ 1.75¢; Bolts, 2 60¢ @ 2.65¢, and Spikes 1.90¢ @ 1.95¢, delivered.

Manufactured Iron and Steel.—The collapse of the strike in the structural trade has led to a rush of orders to send forward material previously contracted for. While the majority of the mills had continued to roll on the part of their specifications they have still been pressed during the current week. No contracts of any magnitude have been placed during the past few days, but it is reported that considerable work is in sight. Bridge contracts are still being taken at very low figures, and much curiosity is shown as to who will secure the two large structures now being figured on—the Allegheny Bridge and the McComb's Dam Bridge. We quote Angles, 1.95¢ @ 2.10¢; Sheared Plates, 1.95¢ @ 2.25¢; Tees, 2.45¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2¢ @ 2.15¢ for Tank, 2.3¢ @ 2.6¢ for Shell, and 2.5¢ @ 2.7¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Swedish Iron.—The market is dull. We quote Rivet Rods, $55.50 @ $56, and Bars, Western specifications, $64.50 @ $65, at tidewater.

Old Material.—The market is dull. We note a sale of 300 tons Mixed Foreign Scrap at $17.50, and small sales of Iron Rails at $20.50 @ $21, while Steel Rails are quotable at $17 on line of road.

Financial.

In financial circles there is an improved feeling compared with a week ago, but prices of most commodities are inclined to droop, and summer dullness is supposed to have fully commenced. The improvement may be ascribed to the cessation of gold exports and increased confidence that there will be no disappointment in harvest prospects. New crops of grain and cotton will add enormously to the available resources of the country, and relief from this source will be particularly well timed. Henry Clew's circular says: "When the crop movement begins, then caution will be necessary. It is likely that, through sales of produce, and possibly securities, we shall regain much of the gold recently spared. The bank reserves are in good shape, and it need not be forgotten that each year the West shows itself less and less dependent upon the East for its supplies of money, and the coming fall may prove no exception." The condition of the Government Treasury, as respects its gold supply, has not improved, the tendency of silver to displace gold being more and more apparent. Its loss since January 1 is approaching $50,

000,000, bearing some comparison with the amount that has been sent abroad. A very good exhibit is made by the exports for May, cotton shipments having continued remarkably heavy, and the outward movement of grain has been good since the break in prices. The total increased valuation of exports for the month, compared with May last year, is likely to figure up about $4,000,000. The latest statistics of the foreign commerce of the whole country show that there was a balance in our favor of $96,000,000, without including upward of $30,000,000 exports of specie in May. The London *Statist*, speaking of the probable exports of gold that must be made from Europe later in the autumn, says: "France alone will need to import wheat from America, for which it will have to pay at least $50,000,000 in gold. Other countries, including England, will be compelled to send some millions of pounds sterling in order to obtain the necessary amount of grain, of which Great Britain, France and the Continent generally are deficient."

Stocks have been dull, but strong. A statement by the Comptroller of the Currency showing that, compared with the same time last year, there were in 11 Western States $13,682,000 more cash in the banks, indicating that these institutions are well supplied with money for the movement of the crops, appeared to have an encouraging influence upon the traders in the grangers.

The news of the purchase of the Canadian mills by the National Cordage Company had little influence. Gold exports for the week were the least in months, which encouraged the bulls. The bond market was again very dull. On Monday there was better foreign buying, the grangers leading in speculation, in consequence of favorable reports from the grain sections giving promise of large transportation. The purchases of Atchison seemed to be based upon the excellent reports of the Kansas Board of Agriculture, which indicate a gain of 8,000,000 on the Agricultural Bureau's estimate, and the harvest in the southern part of the State is well under way.

On Tuesday the early cables reported a heavy tone in London, caused by the shipment of £1,500,000 to Russia. This news induced selling. Trouble between the Chicago and Alton and the other lines in the Western Traffic Association was regarded as of little importance, for the reason that very soon the roads will have all the traffic they can carry. A Berlin telegram said the Paris branch of the Rothschild family, who own the Russian oil monopoly, and the Standard Oil Company have entered into an agreement to control the German market.

Exports from New York for the week were only $5,887,000; imports, $8,081,000; specie exports, $605,000, and since January 1, $67,597,000.

United States bonds were quoted as follows:

U. S. 4½s, 1891, registered	100
U. S. 4½s, 1891, coupon	100
U. S. 4s, 1907, registered	117¼
U. S. 4s, 1907, coupon	118
U. S. currency 6s, 1895	109

The money market was easy. The rate for 60 days on good collateral fell to 4½ %. Some loans were made at 5½ % for four months, but as soon as the deposits of the city banks materially increase it is expected that there will be a good inquiry for paper. The bank statement for last week showed a gain of $3,699,500 in cash and of $3,797,225 in surplus reserve, leaving the latter at $10,484,825. Loans contracted $3,201,800. Nearly $5,000,000 was received from the interior during the week. In Boston the banks, like those in New York, are doing practically nothing in outside time paper. The Hide and Leather National Bank, Chas. B. Fosdick, president, started in "the swamp" on Wednesday, with $500,000 capital. Merchants report that collections are in excellent condition. Houses that have been regarded at times as a trifle slow are paying up promptly and often discounting their bills. Even in the South, where the low price of cotton has compelled planters to hold their product, bills are being met with promptitude. Silver certificates were weak. The posted rates for bankers' sterling are $4.86 @ $4.86½ for 60 day and $4.89 for sight. The market is firm.

The merchandise markets are quiet. In dry goods a more general trade will be soon looked for. Increased business followed the reductions made in bleached goods. The price of wheat dropped about 2¢ a bushel under the Government crop report, and corn 2¢ @ 3¢. The report indicates the spring wheat condition as 92.6, with acreage 103.4, as compared with last year. Statisticians figure out various results, generally concurring in a production exceeding 500,000,000 bushels. There was a break on mild coffees, and sugars are lower for both raw and refined. The Government report on cotton was a surprise. The average condition was fully 8 % higher than expected, while the acreage was 97.7 %, as compared with last year. On its receipt there was marked pressure to sell, and a radical decline in prices came about.

Metal Market.

Copper.—No important change has taken place during the past week. Export interest is moderate at present, and the home trade demand merely fair, with the call chiefly for small lots. About 250,000 lb of Lake Superior Ingot have been placed at 12¾¢ @ 13¢, which prices would yet be accepted by several, if not nearly all, producers. Arizona Ingot is irregularly quoted at between 12½¢ @ 12¾¢, with business unimportant in volume. Casting brands are held at 11½¢ @ 11¾¢, but move rather slowly, although relatively cheaper than furnace material, and in fairly strong position statistically.

Pig Tin.—Speculation has been on a limited scale the past week and prices have averaged a shade lower. At the reduced cost fairly liberal purchases for consumptive account were made during the early portion of the week, but the movement has since been on a limited scale and the demand is moderate at the present time. Straits shipments during the first half of June were 1450 tons, against 800 tons in the first half of last month, but the statistical position, as a whole, remains quite strong and holders are confident. The market yesterday (Wednesday) was very quiet, with spot stock quoted at 20.65¢, bid, 20.80¢ asked, in 10-ton lots; June delivery 20.70¢ bid, 20.80¢ asked; July, 20.60¢ bid, 20.80¢ asked; August, 20½¢ bid, 20.70¢ asked.

Pig Lead.—There has been no change of importance during the past week. Consumers have purchased limited quantities of the metal, and little, if anything, has been done on speculative account. The offering is not remarkably heavy, but apparently freer at the present time than it was a week ago, and for lots of 50 to 100 tons 4.40¢ would very probably be accepted, although 4.45¢ is named as being a close price for single carloads.

Spelter.—Of one choice Western brand about five carloads have been sold at 5¢, delivered, July shipment. Prime brands may yet be secured at 4.95¢, however, and offers of 4.90¢ for common Western have been solicited. The demand at present is slow and chiefly for single carloads.

Antimony.—Under the weight of free offering for both prompt and near future delivery prices have declined still further and the market remains in an unsettled condition. Hallett's quoted at 12¢ @ 13½¢, LX at 13¢ and Cookson's at 14¢, in wholesale quantities.

Tin Plate.—The market has been very quiet throughout the week. Large consumers and dealers having liberal supplies on hand and to arrive manifest little interest at the moment, while importers offer with more or less reserve pending the effect of the higher duty, which goes into effect two weeks hence, upon the local and foreign markets. The supply here is estimated as being equal to three months consumption, with a comparatively large proportion of Coke-finish Steel Plates. Quotations for large lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.30 @ $5.35; J. B. grade, do., $5.40 @ $5.45; Bessemer do., $5.35 @ $5.40; Siemens Steel, $5.50 @ $5.55. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.75 @ $5.80; Siemens Steel, IC basis, $5.90 @ $6; IX basis, $6.95 @ $7. IC Charcoals—Melyn grade, $6.30 @ $6.35; for each additional X add $1.50; Allaway grade, $5.90 @ $5.95; Grange grade, $6 @ $6.05; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.62½; 20 x 28, $11.37½; M. F., 14 x 20, $7.40 @ $7.50; do., 20 x 28, $15; Dean, 14 x 20, $5.15; do., 20 x 28, $10.30; D. R. D. grade, 14 x 20, $4.85; do., 20 x 28, $9.85 @ $9.90; Mansel, 14 x 20, $5; do., 20 x 28, $9.90; Alyn, 14 x 20, $5.10; do., 20 x 28, $10; Dyffryn, 14 x 20, scarce; do., 20 x 28, $10.50. Wasters—S. T. P. grade, 14 x 20, $4.75; do., 20 x 28, $9.30; Abercarne grade, 14 x 20, $4.70; do., 20 x 28, $9.25.

Coal Market.

The Anthracite Coal market is very dull, this being the regular period of summer dullness. Orders for Coal at June prices are now filled, so that consumers are expected to wait until it is necessary to buy. No coal is sold at the 15¢ ₱ ton advance. Steam sizes are weak and plenty. Pea is about $2.25 @ $2 35 alongside, and Buckwheat $1.65 @ $1.75. Some has sold as low as $1.50 alongside, being "market Coal," *i.e.*, Coal afloat and paying demurrage, with no sale. But that is not a fair quotation. Domestic sizes, nothing doing. Activity is not expected until after Fourth of July. Bituminous Coal is quiet, more so than usual. The freights from the Coal shipping ports in New York harbor are quoted at 65¢ @ 75¢ and discharge to Boston.

The Anthracite production for the week was 772,000 tons, for the year 14,969,841 tons; excess over last year 2,262,025 tons. Coke shipments for the week were 101,411 tons. Coke shipments have resumed their former volume; buyers are hard to move; heavy shipments are being made west by lake.

A strike at the collieries of the Delaware and Hudson Canal Company at Parsons was amicably settled.

It is reported that the Lehigh Valley is making improvements at a number of mines with a view of increasing production and tonnage to take the place of that lost by the Coxe-Reading contract.

Work on the new Cambria and Clearfield Railroad, extending from Cresson to the Chest Creek Valley, will begin at once. This will afford a superior outlet to the Central Pennsylvania Coals.

Pennsylvania Railroad Coal shipments for the week ending June 6 were 203,000 tons, and Coke 101,000 tons. Since January 1 Coal shipments increased 675,000 tons, while Coke shipments decreased over 1,000,000 tons.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, June 17, 1891.

The movement in Scotch warrants has been moderate. Outside accounts appear to have been settled to a great extent and the syndicate controlling most of the stock seem inclined to hold for better prices, although the consumptive demand is quiet and the production increasing. There are now 66 Scotch furnaces blowing and stocks in Connal's stores amount to 514,000 tons. The stock of Cleveland warrant Iron has increased to 132,000 tons, but the demand for warrants is better and prices have stiffened to 40/6 @ 41/ during the week. Hematite warrants have also been given more attention and brought somewhat better prices, although two furnaces have been relighted at the Mossbay Works. There is no improvement in the Finished Iron trade. To-day's sales of warrants were at 47/ for Scotch, 41/ for Cleveland and 50/ for Hematite.

Pig Tin prices declined 20/ during the week, owing to realizations by some speculators and absence of support to the market by the principal holders. There has since been a reaction, with a very fair business at about £93.5/ for prompts. The statistical position remains strong, spot stocks being very light, while Straits shipments for the past fortnight are announced as having been only 1300 tons.

At the beginning of the week prices for Copper went somewhat lower under the influence of realizations by holders and some pressure from "bear" operators, who made the most of the opportunity to cover short sales. All offerings were well absorbed, however, and prices have since recovered, with good buying at the advance.

In Tin Plate there has been a fairly large business, chiefly spot lots of Bessemer Cokes at about 15/6 for prompt delivery. Prices are unsettled and rather weak, being affected by the heavy freight and insurance charges. Inquiries for forward deliveries are more numerous, but buyers' and sellers' views are far apart.

Old Iron has received more attention, with interest chiefly in Rails for foreign account.

Scotch Pig Iron.—The demand for makers' Iron continues slow and prices are lower all along the line.

No. 1 Coltness,	f.o.b.	Glasgow	61/
No. 1 Summerlee,	"	"	59/
No. 1 Gartsherrie,	"	"	59/
No. 1 Langloan,	"	"	60/6
No. 1 Carnbroe,	"	"	49/
No. 1 Shotts	"	at Leith	61/
No. 1 Glengarnock,	"	Ardrossan	59/
No. 1 Dalmellington,	"	"	59/
No. 1 Eglinton,	"	"	51/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—No improvement in the demand, but prices very steady. Makers quote 40/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Business moderate, but makers firm, asking 51/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—Demand is slow at present, but prices are steady, with English 20 % quoted at 95/ @ 97/6, f.o.b. shipping port.

Steel Rails.—A moderate business and prices unchanged. Heavy sections quoted £4. 10/ @ £4. 12/6, and light sections £5 @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Market quiet and unchanged. Makers ask £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Small sales making at former prices. Bessemer, 2½ x 2½ inches, quoted at £4. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Dull market and prices unchanged. Bessemer quoted at £4. 10/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Fair inquiry and the market steady. Tees quoted at £2. 15/ @ £2. 17/6 and Double Heads £3 @ £3. 2/6, f.o.b.

Scrap Iron.—Prices steady and the market quiet. Heavy Wrought quoted at £2. 10/, f.o.b.

Crop Ends.—Very little doing. Sellers ask former prices Bessemer quoted at £2. 15/ @ £2. 17/6, f.o.b.

Tin Plate.—Prices further reduced and a very fair business done at the decline. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/6 @ 15/9
IC Bessemer Steel, Coke finish	14/9 @ 15/
IC Siemens " " "	15/ @ 15/3
IC Coke, B. V. grade	14/ @ 14/3
Charcoal Terne, Dean grade	13/6 @ ...

Manufactured Iron.—There has been more doing, but prices have undergone little change. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	8	10	0
" Common "	6	5	0	@	6	7	6
Staff. Bl'k Sheet, singles				@	6	17	6
Welsh Bars (f.o.b. Wales)	5	12	6	@	5	15	0

Tin.—The market firm to-day, with demand fair. Straits quoted at £93. 10/, spot, and £93. 5/ for three months' futures.

Copper.—The offering moderate and sellers very firm. Merchant Bars quoted at £55. 17/6, spot, and £56. 7/6, three months' futures. Best Selected, £59. 10/ @ £60.

The Bituminous Coal Deposits of Pennsylvania.

The Census Office is rapidly closing up its work. The aggregate population of the country by minor civil divisions will be completed, printed and bound in preliminary form by August 1. The volumes on Mines and Mining, Wealth, Debt and Taxation, Transportation, &c., will be laid before Congress in December. The manuscript is now ready for the Public Printer.

The census bulletin of bituminous coal in Pennsylvania has been added to the series of mines and mining of the Census Office. The following is the text of the descriptive portions and conclusions of John H. Jones' able exhibit of this interesting subject:

The bituminous coal deposits of Pennsylvania form the northern extremity of the great Appalachian coal fields, and to a greater or less extent underlie all the territory of the State lying west of the crest of the Allegheny Mountains. The counties of Bradford, Tioga, Potter, Warren, Crawford, Venango, Forest, Elk, Cameron, Clinton and Lycoming, in the northern portion of the State, exhibit only detached basins of the lower measures, which, however, are extensively mined, and the product finds ready markets for manufacturing purposes and for steam. The remaining counties, bounded by the western and southern State lines and a line drawn northward along the eastern boundaries of Fulton, Huntingdon, and Centre counties, thence westwardly along the northern boundaries of Clearfield, Jefferson, Clarion and Mercer, embrace an almost unbroken area of one or more of the important beds belonging to the carboniferous measures. The counties of Allegheny, Westmoreland, Washington, Greene and Fayette, situated in the southwestern corner of the State, contain the upper productive measures, at the bottom of which lies the notable Pittsburgh bed, yielding in the vicinity of Pittsburgh a gas coal of the highest quality; to the eastward the coking coals from which the celebrated Connellsville coke is made, and to the southward the Cumberland steam coals of Maryland.

Small areas of this bed also occur in Indiana, Somerset and Beaver counties. The remaining counties referred to contain only the lower productive measures, ranging from the isolated areas of the Pittsburgh bed to the Brookville bed, the lowest in the lower productive series, and the Mercer, Quakertown and Sharon beds in the conglomerate series. The product from this territory, as well as that from the southwestern counties wherever the lower measures are being mined, is classed in the trade as semi-bituminous, containing as it does less than 18 per cent. of volatile combustible matter. While an excellent quality of coke is produced from coals mined in some localities from these lower measures, the distinctive advantages consist in their superiority as steam and rolling mill fuels, being much sought after for locomotive and steamship uses. In Freeport and Kittanning beds of the lower productive series cannel coal of good quality has been found to overlie the seam for considerable areas in certain localities, but on account of the veins being thin and troublesome to separate in mining it is not deemed of much commercial value.

The quantity of coal mined by the small local banks and farmers' diggings in the State, as reported to the Census Office, was 820,197 short tons. This product has not heretofore appeared in any of the compilations of the output of the bituminous districts. As the collection of this data was delegated to the resident special agents in each county, who were familiar with the territory under their charge, it is believed that the information is complete, and that it presents reliable statistics relating to this important element of the mining industry in Pennsylvania. The quantity sold to the local trade by the regular establishments, and that consumed by the employees, together with this neighborhood mining, reached an aggregate of 1,590,651 short tons, or 4.40 per cent. of the entire production. The total quantity of coal manufactured into coke during the year 1889, as reported to the Census Office, was 10,190,588 short tons, or 28.17 per cent. of the total production. The larger portion of this sum was produced in Westmoreland and Fayette counties, embracing the well-known Connellsville region. Coke of excellent quality is also obtained from the coals of the Mountain, Clearfield, Punxsutawney and Reynoldsville districts, and its manufacture is increasing in importance in those localities.

The output of bituminous coal in the State of Pennsylvania during the year ending June 13, 1880, as reported in the Tenth Census, was 18,425,163 tons of 2000 pounds, valued at $18,567,129, or an average of 100.8 cents per ton. The average number of persons of all classes employed was 33,248, and the total amount of wages paid, $10,863,583. During the calendar year 1889 there were in operation 525 regular establishments and 2949 country banks, producing a total of 36,174,089 short tons, nearly double the output of the census year 1880. The average number of persons of all classes employed was 53,780, and the amount paid in wages, $21,142,051. The value of the total product at the mines, including that consumed in mining operations during the year, was $27,953,315, or an average of 77.2 cents per short ton. No attempt has been made to determine the number of persons employed and the basis of wages at the country banks, owing to the irregular character of the operations.

HARDWARE.

Condition of Trade.

WITH THE ADVANCE of the season and the coming of summer heat there is a perceptible diminution in the volume of trade. There is, however, a fair business doing, though orders for the most part relate to seasonable goods and moderate quantities of General Hardware for replenishing of stocks. Changes in price are comparatively few, and are mentioned in detail in the following columns. Taken as a whole the market cannot be referred to as possessing much strength, but there is a general conviction that the outlook for fall trade is exceptionally good. There is still a good deal of complaint in regard to collections, but in this respect the situation is better than a few weeks ago.

Chicago.

(By Telegraph.)

Demand for Shelf Hardware keeps up very well, but has not changed much during the week. It is a little below the volume of business a year ago. Tin Plates are up 25¢ per box on Bright Charcoal, the case rate being now $7.25. Coke Plates are firm but unchanged at $6 per box. Charcoal Roofing Plates are now $11.25 for 20x28. Boiler Plates are $12.50 per box, 50 Sheets 14x28. Prices are expected to go higher after July 1, but much will depend on the way in which the large stocks now held will be handled. The warehouses here are very full. The demand for tinware is excellent. Orders not only numerous but of fair size.

St. Louis.

(By Telegraph.)

An increasing demand in the Hardware trade is reported. Staple goods are freely ordered and seasonable specialties are also n good demand. Wire Nails are improving somewhat, as the mills refuse to sell at the low prices quoted two weeks since. The Southern and Western trade is unusually heavy just now, and jobbers have some difficulty in keeping up their stocks in certain lines. The Bicycle trade is showing steady gains, and jobbers report the largest season they have ever experienced in this line. There is some talk of low prices having been made on Screws, and this week will probably see some cutting in this direction. Outside of the last named article prices seem to be fairly well maintained.

Cleveland.

THE W. BINGHAM COMPANY.—The past two weeks have been rather featureless, as regards the Hardware trade hereabouts. Orders have been quite numerous, but not large, and of the "sorting up" kind. It is too late in the season now to expect many changes, but the outlook for the fall is excellent. Crop prospects are very encouraging, unless something unforeseen and very unusual should happen; crops of all kinds will be large—fruits particularly so—so dealers will do well to have good stocks of everything that appertains to canning processes. Nails are in good demand at the extremely low prices now ruling. Orders for Wire are still coming in at slightly advanced prices. There is some inquiry for Sheet Iron for fall delivery, with prices ruling some lower than last season. Collections are only moderate.

Louisville.

W. B. BELKNAP & Co.—Seasonable weather, warm and dry after copious rains, has done much to improve crop prospects and a feeling of more confidence is very evident both in the cities and in the country. Orders are coming in more freely and collections, considering the disappointments of last year, are not bad. The banks, too, have materially strengthened themselves and from all indications will not soon again be as hard run as they were last fall. There is a fair demand for Bar Iron at the low figures which have been prevailing for some time past. Threatened advances are treated with certain incredulity, as the almost utter absence of new ventures and the extreme economy of the railroads have curtailed the demand for new supplies. However, there must be an end to this and we shall reap the benefit of the accumulated purchasing power after while. The general liquidation of banking, manufacturing and mercantile concerns noted in our last is still going on. So far Hardware seems to have suffered less than almost any other branch. Whether this is due to peculiar conditions of the trade or to the unusual astuteness of the gentlemen engaged in that line of business is something that we must leave to outsiders to say.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Conditions of trade in this section have not materially changed since last reports. The country, generally, has had fine rains, which were much needed and came just in the nick of time to save crops in some sections. The outlook was never more promising than at the present time. We have to report collections fully up to the average and from some sections better than they were last year. The demand for Staple Goods still continues large, sales in Barb Wire especially being much larger than any previous year.

Omaha.

LEE - CLARKE - ANDREESEN HARDWARE COMPANY.—The wholesale trade of Omaha does not present any especially new features. Trade is about as good as usual at this season of the year, and, as a general thing, quite satisfactory. The number of country orders received is quite large, but they are mostly for a limited amount of goods. Jobbers on the Missouri River do not expect to see much change in the situation until after harvest, when, if the crops prove to be large, there will likely be more liberal buying. In fact, if the crops should turn out to be heavy and prices good, great activity in all lines of business is looked for. Crop conditions continue most favorable in all sections of the West, and the prediction that the yield will be unusually large seems in a fair way of being verified. What is fully as important as the prospective large crops is the prospective high prices at which it is conceded these crops are likely to sell. The reports from Europe indicate that heavy drafts will have to be made on America for grain, &c., to make up their deficiency. If this if so, higher values may reasonably be expected unless our production largely exceeds the demand. Owing to the large and continued outflow of bullion to Europe, and our "silver" legislation, together with the large amount of money required to move the crops, some bankers and capitalists are led to express the opinion that money will be very close and scarce this fall, particularly in the large Eastern financial centers. This, of course, is merely conjecture, but, judging from the general situation at present, it is a condition not unlikely to occur.

Portland, Ore.

FOSTER & ROBERTSON.—The trade so far this month fully sustains the promising outlook which we mentioned in our last letter, and although there does not seem to be the rush and drive to business that there was two years ago, or even one year ago, yet there is a constant and steady movement of goods, and we find, much to our surprise, considering the comparative ease with which the business is now handled, that sales so far indicate a modest increase over the two years mentioned. There has been no change in prices since our last letter. The feeling is general among the jobbers that we have about reached the bottom, and the hope is entertained by many, in view of the promising crop outlook, that better prices will prevail in the near future. However, there can be no material advances here as long as the depression continues in Eastern business circles, for the reason that Eastern jobbers, finding their trade falling off in their usual territory, are compelled to seek new and more distant points, such as the Pacific Coast, in order to unload a portion of their overstock.

Collections drag, and will continue to do so until farmers have something to sell, which as a rule will not be until fall, although in some sections there is considerable wool, which is now coming or will soon come into market. On Monday, June 1, there was held in the three cities which lie adjacent to each other on the banks of the Willamette at this point and near its junc-

tion with the great Columbia River one of the most important elections ever held in the Pacific Northwest, resulting in an overwhelming majority for the consolidation of the three cities into one, so that today Portland stands a city of 75,000 people, more alive to the many natural advantages it possesses than ever before, the center of many navigable streams extending miles and miles in every direction, the terminus of three transcontinental railroads, with two others working rapidly this way, the commercial metropolis and the natural market for a vast territory of incomparable richness in natural resources—the proud mistress of the grandest empire the sun ever shown upon—an empire in which she need never fear and can never have a rival.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues fairly satisfactory, taking into consideration the lateness of the season and the prevailing hot weather. There is every indication that there are no large stocks of goods on hand by the frequent mail orders. Although they contain demands for only a small line of goods, nevertheless their frequency indicates no overstock, as it also indicates a fair trade. Perhaps there was no time during the last year when mail orders were so frequent as during the last two weeks. Season goods continue in demand. In fact, it is almost impossible to supply the daily wants of Screen Doors, Window Screens, Ice-Cream Freezers and Cherry Seeders. Wire Nails and Barb Wire are moving quite freely. Collections still continue below the average, and many of the small trade are asking leniency temporarily. The prospects for a large crop are encouraging to the dealer, and an early and good fall trade is anticipated

Baltimore.

CARLIN & FULTON.—The business situation is but little changed since our last report. The demand is excellent for such goods as are adapted to the season and which go into immediate use, but otherwise orders are not large, the trade being disposed to postpone heavy purchases until after July 1. Business generally in this city in all lines has been good, as shown by the bank statement for the week just ended, the aggregated clearings being almost equal to those of the corresponding week last year, which were then unusually heavy. From the fact that the trade has bought cautiously during this entire year, thereby carrying light stocks, with accounts well liquidated, there is every reason to believe that the demand this fall for goods will show a great improvement over this spring's business. Large crops, even at low prices, stimulate trade; they must be transported, and when the railroad companies are busy so is the entire country. We have been advised of advances in the prices of Padlocks and also of Shot, and we think the low figures that have prevailed in many lines will be followed by higher prices just so soon as unwise competition among the manufacturers can be removed and the demand for goods increases.

Notes on Prices.

Wire Nails.—During the past week the demand for Wire Nails has been only moderate. Some sales are reported at prices not materially different from those which have been ruling for some weeks. The mills are apparently desirous of booking orders. The general price at factory for carload lots remains $1.95 to $2, but these figures are sometimes shaded on exceptionally desirable orders. Small lots from store are held at from $2.15 to $2.25.

Chicago, by Telegraph.—Nothing new has occurred in this line. The usual price for factory lots is $2.05, Chicago, while jobbers quote $2.15 from stock. The demand is not heavy at present, but both manufacturers and jobbers report a steady demand in a moderate way.

Cut Nails.—The market shows but little change since our last review, prices continuing as before. The tone of the market is not strong and yet it is not expected that prices can go much below their present level. Quotations are on the basis of $1.55 at mill for carload lots, with a 25 cent average. Small lots from store in New York are held at $1.75 to $1.80.

Chicago, by Telegraph.—Manufacturers report considerable inquiry for Steel Cut Nails, but only a limited trade in progress. They quote $1.70 Chicago, on a 30 cent average, while jobbers sell at $1.80 from stock, which is shaded a trifle to best buyers.

Barb Wire.—Trade is generally reported as rather sluggish, it not being the season of the year when orders are placed with much freedom. There is some rumor of irregularity in prices, but this is generally supposed to be limited for the most part to the cutting of prices by jobbers, whose purchases at lower figures enable them slightly to undersell the manufacturer. The impression is also given that in some cases old contracts are given an elastic interpretation, but this is without distinct verification. The next month or two are regarded as likely to determine the question as to whether the manufacturers will be able to maintain the schedule of prices adopted by them.

Chicago, by Telegraph.—The weakness reported in the last issue has developed into distinctly lower prices, and it is now seen that the cause is the diminution of orders from manufacturers. Jobbers are selling Painted at $2 75, from stock, which, of course, means lower prices than the schedule fixed by manufacturers for carload lots. The weakness has occurred in the face of good inquiry from the jobbing trade, but which is evidently not quite strong enough to keep the manufacturers steady. Jobbers here insist that they have not been the first to reduce prices, but that they were forced to meet competition from houses in St. Paul and Minneapolis who were cutting into their trade. The advance on Galvanized over Painted is not being maintained at schedule rates, but is also shaded to best buyers.

Padlocks.—After a long period of thoroughly demoralized and unprofitable prices the manufacturers of Padlocks have again come together, and quite unexpectedly to the trade, have made an important advance and adopted new list prices and discounts. The advance took place last week in the form of the announcement of a temporary discount of 70 and 2 per cent. from the old list. A new list has subsequently been announced, which, we are advised, is substantially the list of 1884, and is subject to a discount of 50 and 2 per cent. A system of quantity discounts has also been determined upon. The new prices are represented in the following list of Sargent & Co., New York and New Haven., Conn., subject, as above stated, to a discount of 50 per cent., with 2 per cent. additional for cash in 30 days:

No.	One Key.	Two Keys.	No.	One Key.	Two Keys.
20	$2.25	$2.65	345	5 00	6 00
21	2.25	2.65	345C	6 00	7 00
22	2 50	2.90	346	3.50	4 10
23	2 75	3.15	347	4.00	4.55
24	3.00	3 40	347C	5.00	5.60
25	3.25	3 65	348	5.00	6.25
30	2.25	2.65	349	6.00	6.75
31	2.25	2.65	349C	8.00	8.75
32	2 50	2.90	352	3.00	3 60
33	2 75	3.15	355	3.75	4 30
34	3.00	3.40	356	5.00	6.00
35	3.25	3.65	357	5.00	5.75
60	3 50	3.90	358	5 25	6 25
61	3 50	3.90	361	4.00	4.65
62	3.75	4.15	363	5.00	6 25
63	4 25	4 65	365	3.75	4 30
64	4.50	4 90	366	8 50	9 15
65	4 75	5 15	369	7.50	8.20
70	3 50	3 90	369C	9.00	9.70
71	3 50	3 90	385	4.00	4.65
72	3.75	4.15	386	4.25	4.90
73	4 25	4 65	386C	5.50	6.15
74	4.50	4.90	401	4.00	4.45
75	4.75	5 15	402	4.50	5.25
100	1.00	1 15	402C	5.50	6.25
120	1 05	1.20	403	4.75	5.40
122	1 75	2.20	403C	5.80	6.40
190	1 50	1.75	404	5.00	5.75
200	1 50	1.75	405	5.25	6.00
201	1.70	1 95	405C	6.25	7.00
202	1.80	2.05	406	5.00	5.75
202C	2 80	3.05	406C	6.05	6.80
203	2.00	2.60	407	5.25	5.90
203C	3.00	3 60	407C	6.25	6.90
204	2.50	3.05	408	5.50	6.25
208	2.75	3 75	409	5 75	6.50
215	3.25	3 90	409C	6.75	7.50
216	3 50	4 15	411	5.00	5.65
216C	4.50	5 15	435	9.00	9.75
218	3.25	3 90	502	6.50	7.55
222	3.75	4.40	605	4.00	4.55
223	4.01	4 75	607	6.00	6.65
232	4 25	5.00	607C	7.25	8.50
232C	5.25	6.00	619	6.00	6.80
301	2.10	2 35	702	4.00	4.55
302	2 30	2 55	705	5.00	5.65
303	2.50	2.90	706	5.25	5.95
304	3.15	3 65	708	6.00	7.00
305	3.90	4.90	709	6.50	7.15
307	4.25	4.90	715	5.50	6.20
312	2.50	2 75	716	7.50	8 20
313	3.00	3.60	717	7.50	8.25
315	2 90	3 30	718	6.00	6.75
316	3.05	3.65	719	7.00	7.65
316C	4.25	4.85	725	12.00	13.00
317	5.00	5 75	815	5.25	5.80
318	4 00	4.55	816	7.00	8.25
319	5.00	6.00	818	7.25	7 90
321	2 75	3.00	819	7.50	8.50
321C	3.75	4 00	855	9.00	9.75
325	3 00	3.60	982	.....	4.20
325C	4.00	4.55	982C	.....	5 20
335	3 40	4 00	982P	.....	9.90
335C	4.60	5.30	983	.....	4.70
336	3.50	4.15	983C	.....	6.20
342	4 00	4.75	983P	.....	12.60
343	5.00	6 00	984	.....	5.55
344	4.50	5.50	984C	.....	7.05
344C	5.50	6.50			

The following is the list of Russell & Erwin Mfg. Company, New York and New Britain, Conn., which is subject to a discount of 50 per cent., and 2 per cent. additional for cash in 30 days:

Padlocks.

No.	With 1 key. Per doz.	With 2 keys. Per doz	No.	With 1 key. Per doz.	With 2 keys. Per doz.
5000	1.05	1 20	1001	1.75	2.20
4000	1.00	1 15	1200	2.50	3.05
3000	1.50	1.75	1201	3.00	3.65
2000	1 50	1.75	1203	3.25	3.90
200	1 70	1.95	1205	4.00	4.65
201	1 80	2.05	1206	4.25	4.90
202	2 10	2.35	1209	5.00	5.65
203	2 30	2.55	1210	5.00	5.65
204	2.50	2.90	1212	6.75	7.75
205	2 90	3.30	1213	9.50	10.50
206	3.05	3.65	1218	3.75	4.40
207	3.75	4.30	1219	4.00	4.65
208	4.00	4 55	1222	3.75	4.40
209	3.50	4.10	1225	4.75	5.40
210	4.00	4.55	1227	6.00	6.65
211	5.50	6.20	1231	3.75	4.50
212	5.25	5.80	1232	4.25	4.90
213	7.50	8.20	1233	5.00	5.75
214	2 50	2.75	1234	5.50	6.25
215	3.15	3.65	1235	2 75	3.40
216	4 50	5.25	1236	3.25	3.90
225	3 50	4.15	1237	4.00	4 75
226	3 40	4.00	1238	4.50	5.25
230	5.00	5.65	1240	2.75	3.40
232	6.00	6.80	1241	3.25	3.90
242	4 00	5.00	1242	3.50	4.15
243	4.50	5.55	1243	4.00	4.65
244	3.75	4 40	1245	5.25	6.00
245	4 25	4.90	1246	5.75	6.50
246	2.75	3.00	1247	4.25	5.00
247	3 00	3.60	1248	4.75	6.00
280	7.50	8.20	1301	3.75	4.40
301	2.80	3.05	1309	5.50	6.15
306	4.25	4 85	1313	11.00	12.50
313	9.00	9.70	1322	4.50	5.15
314	5.00	5.60	1325	5.80	6.40
326	4.60	5.30	1345	6.25	7.00
346	3.75	4 00	1346	6.75	7.50
347	4.00	4.55	1347	5.25	6.00
1000	1.75	2 20	1348	5.75	6.50

The manufacturers are to be congratulated on being able to carry this advance into effect so successfully and without giving to the trade previous intimation of their action, so that it is understood that very few orders were placed before the advance. The manufacturers appear to be holding the new prices firmly.

Fry Pans.—Current quotations by leading manufacturers represent a decline from the prices which were prevailing some time ago, and also show that the market is characterized by a good deal of uneveness.

Cordage.—The Cordage market shows no improvement since our last issue, but it would appear that the position of the National Cordage Company is somewhat strengthened by their acquisition of all the important Cordage mills in Canada. These mills are eight in number, and are situated in Halifax, St. Johns, Quebec, Montreal, Lachute, Port Hope, Toronto and Brantford. It is reported that the aggregate amount paid for these mills is $2,000,000. The prices made by the manufacturers are substantially the same as those referred to in our last issue, though it would appear that concessions are given somewhat more freely. The manufacturers' price of large lots of Manila is now 9 to 9¼ cents and for Sisal, 6¼ cents.

Glass.—Some factories claim to be short of Glass, while others state that they have large and well-assorted stocks. Quotations from one factory during the past week were on the basis of 80 and 15 per cent. discount for a desirable assortment in carload lots. It is expected that the American Window Glass manufacturers will hold a meeting in Chicago some time this week. The warm weather during the past week has doubtless restricted the production of Glass to a considerable extent. Prices on imported Glass remain unchanged. A meeting of Window Glass importers is to be held at Boston on the 19th inst. Quotations on Glass are unchanged, as follows: American Window Glass, for carloads, 80 and 10 per cent. discount; less than car lots, 80 and 5 per cent. discount; French Window Glass, 75 and 10 and 5 per cent. discount, with an additional 5 per cent. discount when 50 boxes are ordered and taken in any calendar month. American Plate is held at dis count 50, 10 and 5 per cent., and Imported Plate at discount 60 per cent.

E. Covert Mfg. Company.—The following are the net prices to the retail trade as announced by E. Covert Mfg. Company, Farmer Village, N. Y., the goods being described and illustrated in their catalogue No. 15:

Neck Yoke Centers.

	Per doz.		Per doz.
No. 1 Centers	$5.40	No. 2½ Centers	$4.38
" 2 "	5.16	" 3½ "	3.30
" 6 "	10.02	" 4½ "	4.50
" 8 "	10.02	" 3 "	5.94
" 5 "	3.60	" 4 "	5.82
" 5½ "	3.84	" 10 "	8.88
" 1½ "	3.18	" 12 "	8.82

Trimmed Neck Yokes.

	Per doz.
No. 14	$8.40
" 15	6.00
" 15½ 1½, 1⅝ inch	4.44
" 15½ 1¾ "	5.04
" 15½ 1⅞, 2 "	5.70
" 22 1⅛, 1⅜ 1¾ "	10.20
" 22 1⅞, 2, 2⅛, 2¼ "	11.40
" 22½	7.80
" 23	6.60
" 24	13.14
" 16 1½, 1⅝, 1¾ inch	10.20
" 16 1⅞, 2, 2⅛, 2¼ "	11.28
" 17	8.40
" 32	19.98
" 34	22.38
" 30	16.20
" 28	19.98
" 26 1½, 1⅝, 1¾ inch	16.20
" 26 1⅞, 2, 2⅛, 2¼ "	17.04
" 26½	12.60
" 36	7.10
" 38	7.10
" 40	10.20
" 37	5.82
" 39	5.82

Neck Yoke Loops.

	Per pound.
Nos. 42–44, Plain Loops	$0.12
" 46–48, " " X C	.14
" 50-52, Plate "	.12
" 54–56, " " X C	.18

Neck Yoke Tips.

	Per pound.
Nos. 58, 60, 62, Yoke Tips	$0.12
	Per doz. pair.
No. 64, Yoke Tips	$1.56
" 66, "	1.80
" 68, "	1.86
" 70, "	2.16
" 72, "	4.80
" 74, "	6.00
" 76, "	6.30
" 78, "	7.80

Safety Pole Tips.

Covert's patent.

	Per doz.		Per doz.
No. 262	$2.10	No. 280	$4.20
" 264	2.40	" 282	4.50
" 266	2.70	" 284	4.80
" 278	3.00	" 286	9.60
" 270	2.70	" 288	10.20
" 272	3.00	" 290	11.10
" 274	3.30	" 292	11.40
" 276	3.60	" 294	12.00
" 278	3.90		

Wilson's patent.

	Per doz.		Per doz.
No. 263	$2.64	No. 281	$5.28
" 265	3.00	" 283	5.64
" 267	3.36	" 285	6.00
" 269	3.72	" 287	12.00
" 271	3.42	" 289	12.78
" 273	3.78	" 291	13.86
" 275	4.14	" 293	14.28
" 277	4.50	" 295	15.00
" 279	4.86		

Shaft Tips.

	Per pound.
Nos. 80–82	$0.13

	Per doz. pair.		Per doz pair.
No. 84	$0.60	No. 92	$1.13
" 86	.72	" 94	1.36
" 88	.72	" 96	2.10
" 90	.84		

Shaft and Pole Adjusters.

	Per doz.
No. 142, Covert's Patent	$5.40

Curtain Straps and Knob Patches.

	Per gross.
No. 143, Knob Patches	$0.30
" —— Curtain Straps..Price on application.	

Bridle Rosettes.

	Per doz pair.
No. 1054, Jockey Club	$2.40
" 1044, Crystal	2.10
" 1022, Luminated Crystal	2.10
" 1042, Comet	1.12
" 1008, Coupe	.72
" 1005, Trade Dollar	.30
" 144, Eclipse	.30
" 144½, Embossed	.30

Hame Straps.

	Per doz.
No. 150, C. B. B	$0.72
" 151, "	.79
" 152, "	.90
" 153, "	1.08
" 154, "	1.44
" 168, L. B. and L	.72
" 169, "	.79
" 170, "	.90
" 171, "	1.08
" 172, "	1.44
" 224, Dandy	.79
" 226, "	.90
" 228, "	1.08
" 230, Fairy	.79
" 232, "	.90
" 234, "	1.08

Hame-Strap Attachments.

	Per gross.		Per gross.
No. 179, C. B. B.	$1.15	No. 165, L. B. & L.	$1.46
" 180, "	1.38	" 166, "	1.64
" 182, "	1.44	" 167, "	1.85
" 184, "	1.62	" 212, Dandy	1.80
" 186, "	2.12	" 214, "	2.10
" 188, "	2.38	" 216, "	2.40
" 190, "	2.70	" 218, Fairy	1.69
" 162, L. B. & L.	.96	" 220, "	2.18
" 163, "	1.09	" 222, "	2.29
" 164, "	1.27		
" 164½, "	1.37		

Wire Tuck Loops.

	Per gross.
No. 197, X C or Japanned	$0.14
" 198, " "	.16
" 200, " "	.19
" 202, " "	.22
" 204, " "	.26
" 206, " "	.32
" 208, " "	.35
" 210, " "	.41

Leather Horse Ties.

	Per doz.
No. 350, Covert's	$5.04
" 352, "	6.48

Strap-Eye for Leather Ties.

	Per doz.
No. 360	$0.27

Adjustable Leather Halters.

	Per doz.
No. 236, Covert's	$7.80
" 238, "	10.20
" 240, "	6.90
" 242, "	9.30

Cyclone Halter Trimmings.

	Per doz. set.
No. 174, for 1-inch Strap	$0.82
" 176, " 1¼ " "	1.08

Trace Buckles.

	Per doz.
No. 256, Charm	$0.66
" 258, "	.72
" 260, "	.84

Overdraw Loops.

	Per gross.
No. 244, Gem	$0.36

Strap Protectors.

	Per gross.
No. 246, Climax	$1.36
" 248, "	1.44
" 250, "	1.58
" 251, "	1.73
" 252, "	2.02

Wagon Jacks.

	Per doz.
No. 300, Victor	$5.94
" 254, Daisy	3.60

Wet Umbrella Racks.

	Per doz.
No 196, Covert's	$3.00

Folding Nail Boxes, &c.—Cook & Smith, 25 Park place, New York, are offering the trade Folding Nail Boxes to hold 2, 3, 4, 5, 6, 8, 10, 15 and 20 pounds. These are referred to as costing no more than paper and as saving temper, twine and time. They pack perfectly flat, having the merchant's advertisement printed on each box. The manufacturers state that Nails or other small Hardware can be put up in about one tenth of the time required to wrap them in paper, and a package handed to the customer not to be ashamed of. These are sold in lots of 500, at 4½ cents a pound, from which a discount of 20 per cent. is allowed to the jobbing trade. The same parties also manufacture a line of Nail Bags which are made from heavy rope manila paper. The following are net prices to the retail trade, and are subject to a discount of 25 per cent. to jobbers:

Nail Bags.

Size.	Per M.
7 x 7 inches for 3 pounds Nails	$5.00
8 x 8 " " 5 pounds "	5.50
9 x 11 " " 10 pounds "	6.00
11 x 13 " " 15 pounds "	8.00
13 x 14 " " 20 pounds "	11.50
13 x 15 " " 25 pounds "	12.50

These Nail Bags are referred to as particularly adapted for climates where the Folding Nail Boxes cannot be used.

They also manufacture Shot Pouches, made from a tough red glazed Hardware or rope manila paper, as preferred. The following net prices to the retail trade are subject to a discount of 25 per cent. to jobbers:

Shot Pouches.

Size.	Per M.
No. 1 3¾ x 5¼ inches	$3.00
" 2 4¼ x 6¼ "	3.50
" 3 5¼ x 7¼ "	4.25
" 4 5¼ x 9 "	5.00

Wire.—Fence Wire is held at irregular prices, the market being in a decidedly unsettled condition. There is considerable diversity in the quotations made by leading mills.

Loaded Shells—There has been no specially new development since the reduction in price by the associated manufacturers and the announcement of the same prices by the outside makers. In view of the fact that the production of these goods is not yet equal to the demand, it is the part of wisdom for buyers to place their orders in good season, so as to insure obtaining the goods before the anticipated scarcity.

Scythe Snaths.—The market is an open one, and there is some difference in the prices made by the various manufacturers and jobbers.

Chain.—The makers of Trace, Wagon and Fancy Chains have been shading their previous quotations, which result in lower prices to careful retail buyers, by whom discounts ranging from 60 per cent. to 60 and 5 per cent. may be obtained.

The Chicago Axe Company.

FOR A YOUNG institution the Chicago Axe Company of Hammond, Ind., show most excellent results. They are now, we are advised, turning out 1200 Axes daily, and expect to be able to work up to 4000 or 5000 daily as soon as arrangements now under way are completed. Their capacity will then be equal to if not greater than that of any other Axe factory in the country. They occupy a remarkably fine building in a most eligible location. The building consists of a main structure with two wings, their dimensions being respectively 420 x 70 feet, 325 x 70 feet, and 276 x 70 feet. The main building is two stories high and the wings are one story. The visitor to these works cannot fail to be impressed with the abundance of light and room enjoyed by the workmen, who are too often crowded into narrow and badly lighted quarters when engaged in this class of work.

The company at present manufacture a full line of Axes and Hatchets, but propose at an early day to fit up a portion of their plant now not in use for the manufacture of Hammers or other articles which can be handled in connection with their Axe trade. The process by which their Axes and Hatchets are made is largely original with the company. They cast the blanks from the best quality of Lake Superior charcoal iron, after which they are annealed in a specially constructed furnace, which requires several days, during which time special treatment is given by the addition of recarbonizing material which converts the iron into steel. The process of annealing is carefully watched, and tests are made from time to time to determine when the metal is in proper condition. After the blanks are taken from the furnace they are placed under hammers and further refined by forging. The company claim that in this way they secure a tool of exact shape, there being no imperfect eyes and every part being true to gauge, while there is no weld to open and the edge can be ground up as far as the tool can be used. The process has been elaborately formulated on scientific conditions by the superintendent, H. F. Meikle. The blade of an axe or a hatchet made by this process shows a remarkably fine steel fracture when broken, and the company guarantee to make a tool that will outstand any test of tools made of crucible steel. They are now getting up patterns for a new Axe to be called the Monogram, which they intend to give a crocus finish, as fine as that of a razor blade.

There are now employed in the works eight tempering fires, 28 run of grindstones, and emery wheels for polishing. The finishing department will soon be extended to 40 grindstones and they will then have 30 polishing stones. The works are lit at night with electric light furnished by the company's dynamo. The plot of ground occupied comprises 3½ acres, and there are railroad tracks on three sides of the works, connecting with seven railroads, while three more roads are coming in. F. W. Hawkins, the general manager of the company, is well-known to the Hardware trade of the country, having formerly been connected with Sargent & Co., but more recently with the Michigan Axe and Tool Works, which he built and which under his management secured a wide patronage from the jobbers of the country. J S. Given, Jr., of the Pullman Palace Car Company, is acting president, and W. W. Young, auditor of the same corporation, is secretary and treasurer. The Chicago Axe Company are not connected with any combination of manufacturers.

Trade Items.

THE ENTERPRISE MFG. COMPANY of Philadelphia send us a copy of a decision just rendered by Judges Butler and Atchison, against Peter Deissler, as manufacturer, and John Wanamaker, as seller, both of Philadelphia, for infringing their Meat Chopper patents. The defendants are ordered to pay all damages that the complainants have sustained, and report to the Court an account of the profits received. Also, that they shall pay to the complainants the costs of the suit. The decision in this case is regraded as an important one, strengthening and establishing the "Enterprise" Meat Chopper patents. We are informed that there are other cases pending, in which the Enterprise Company expect a decision in the near future. Attention is also been called to the fact, which we have already mentioned, that the company are now tinning all their Meat Choppers, instead of galvanizing them, as heretofore. This, it is claimed, is a great improvement, the superiority of tin as a coating for cast iron being recognized, especially as applied to articles intended for domestic purposes. Other improvements have also been made in the Choppers since last season, and they are referred to by the manufacturers as now made better than ever.

BINDLEY HARDWARE COMPANY, Pittsburgh, Pa., under recent date send a card relating to Nails. This is 5½ x 8 inches in size, with a perspective view of their new building on one side and lists of Steel and Wire Nails on the other side. Between these two Nail lists, which are on either side of the card, is a smaller picture of their building.

POLAND & CROUCH have succeeded Stilwell & Poland in the Hardware business at Carrollton, Mo., N. E. Crouch having purchased the interest of Mr. Stilwell. In a recent issue we erroneously stated that Mr. Crouch had purchased the interest of Mr. Poland, the fact being as intimated above, that Mr. Stilwell's interest had been bought.

MORRIS C. PENNOCK, surviving member of the Hardware firm of Wright & Pennock, Alliance, Ohio, which was dissolved by the death of the senior partner, Alfred Wright, in July last, has entered into a copartnership with Arthur Wright, Ida M. Wright and Ella V. Hartley, children and heirs of Alfred Wright, for the purpose of continuing the general Hardware business in the former premises with the

same capital and under the same firm name of Wright & Pennock. We are advised that this house was established in November, 1862, and continued uninterruptedly until the death of Mr. Wright. The new firm will assume the assets and liabilities of the old concern.

COOK & SMITH, 25 Park place, New York, in connection with the Twine which they are selling, offer the Handy Twine Rack. The Rack is designed to be hung in a conspicuous place in the store, to invite purchases of Twine. The frame is so constructed as to allow the rods holding the Twine to be easily removed, the ball slipped off and the rod returned to its place. With orders for a small amount of Twine a Rack is sent without charge.

ELBEL & Co., Canton, Ohio, issue a circular giving the text of the decision by Judge Jackson in the Circuit Court of the United States for the Northern District of Ohio in the suits brought by August Buerman, Newark, N. J., to prevent Elbel & Co. from making certain Riding Spurs. Judge Jackson decided both suits in favor of the defendants. Elbel & Co. entitle their circular "He who laughs last laughs best."

C. L. DEAN, treasurer of Ludlow-Saylor Wire Company, has severed his connection with this house, and sent in his resignation, to take effect July 1. Mr. Dean has been with this concern during the past five years, in which time the business of the company has rapidly increased, and it is no reflection on his associates to say that a good share of the credit is due to the efforts of Mr. Dean. During his connection with the establishment he made many warm friends in the trade, who will greatly regret his withdrawal. Mr. Dean has not made any definite arrangement for the immediate future, but will take an early opportunity of advising his friends of his whereabouts. He will be succeeded by Frank Lowe, who has been with the well-known house of Montague & Co., San Francisco, Cal., for a number of years.

IN HIS ADVERTISEMENT in this issue C. J. Healy, 106 Chambers street, New York, calls attention to his line of warranted American Gun Locks, with illustration and a description of their special features.

Art in Hardware.

ARTISTIC HARDWARE was an almost unknown term a few years since, but now implies much more than is generally understood by a trade term, and, in fact, has great significance with the manufacturer of the present day. The evolution in this line has been wonderfully rapid within the last ten years, and, in fact, has become a revolution in that time. Greater advancement has been made of late years than at any time since the apparent death of art as applied to Hardware. The exquisite work of the Ancients is more nearly approached to-day than ever before, and progress in this line is practically but commencing.

As a necessity, the production of goods has also undergone a complete change, and where but a short time since the manufacturer had a few stock patterns of a stiff Gothic design and really no variety, those of the present day have an almost endless line from which the most fastidious may select. Plainness of surface and outline has taken the place of the old ornamental designs, and the colonial school for general trimmings is the one most adhered to, while for the special lines of architecture the Italian and French Renaissance, Byzantine and Romanesque schools have their share.

Manufacturers have found it necessary to engage skilled artists for their modeling and chasing rooms. Most of the finer trimmings are produced from special designs, made or approved by the architects, and their development in the hands of the modeler, molder and chaser, is work requiring skill and a thorough knowledge of detail.

In a case where a casting is to be made from a renaissance design, as much care is required as in producing a fine piece of jewelry, and the work of the chaser in finishing a casting of this sort is exceedingly delicate, and much of the effectiveness of the piece lies in his hands. In finishes of castings for House Trimmings there is almost endless variety, including gold and silver plate, brass, bronze and copper, in many different effects, although for general uses brass and bronze are most in demand, in plain and antique finish, while dead black on iron, for outside purposes, is rapidly becoming very popular. As to iron, an effectiveness not attainable in the bronzes is produced, both in wrought and cast, and the wrought grilles of the present time are marvels of beauty and grace, combined with an inherent strength which alone can be found in this metal. There seems to be scarcely any limit to the field opening before the hammer and the anvil, and as education in art advances, in the same ratio does the degree of excellence in the production of this line move forward.

Cast-iron trimmings, too, are almost entirely new. It was but a short time since when iron was used only where strength and solidity were required, now the most delicate designs are produced in this metal as well as in the bronzes The general Hardware trade are more or less interested in the use of aluminum as applied to their especial line, and two or three concerns have made castings of it, but the cost of the metal itself, and difficulties found in finishing, make it thus far not at all a success. Even though cost of the metal might in time be reduced the probability of its ever taking the place of bronze in art Hardware is questioned, on account of the cost of preparing it for the market.

Commercial Travelers' Congress.

DELEGATES from nearly all the leading associations of traveling men met June 10 at the Palmer House, Chicago, and effected the permanent organization of a World's Fair Committe, by the election of George J. Reed as president and C. H. Hinman as secretary. Representatives were present from the Northwestern Traveling Men's Association, the Iowa State Association, the Western Association of St. Louis, the Boot and Shoe League of Boston, the New England Association, and the local associations of Toledo, Cleveland, Indianapolis, Bloomington and Peoria. The convention decided to hold a two weeks' congress at the World's Fair. All organized bodies of traveling men in the United States and foreign drummers as well will be invited to participate. It was decided that a Committee of Control, composed of one member from each association, be selected to go over the affairs of the body, and treasurers appointed to raise not less than $50,000 to defray the expenses of the congress.

The association adjourned to meet at the call of the president.

Sidewalk Obstructions.

CHICAGO Hardware merchants are affected in several conspicuous instances by a recent order of the city authorities demanding the removal of sidewalk obstructions. The order was primarily occasioned by the encroachments on crowded thoroughfares of the retail tradesmen, who are inclined to exhibit their entire stock in front of their stores or else to make their signs conspicuous even if they obstruct travel on the sidewalks. But orders regulating these abuses are general in their character, and therefore affect wholesale merchants in less traveled streets, who cannot avoid the use of sidewalks to some extent during business hours. The house of Hibbard, Spencer, Bartlett & Co. would suffer considerable inconvenience, for instance, if no part of the sidewalk could be used for the deposit of packages awaiting drayage to the railroad depots. The firm some time since erected a substantial awning to protect the goods on the sidewalk from rain, in consequence of which they can ship goods uninterrupted by the weather and without fear of damage. It is therefore a convenience to their customers, as well as to themselves, and, as it stands on a street having very little travel, it would seem to be a fit subject for exemption from the operations of a general rule. It seems reasonable that regulations of this character should be construed in the best interests of the city. Sidewalks should certainly be kept clear at all times on leading thoroughfares, but wholesale merchants should be permitted some latitude in their part of the city, as on their prosperity much of the city's growth and financial strength may depend. To cramp their facilities certainly means the crippling of their prosperity. The report of a committee of Chicago merchants, who were called upon for consultation by the city authorities, contains the following practical regulations of street obstructions which they recommend:

1. That permanent structures should be removed from the sidewalks, except where such removals would cause serious injury to business interests.

2. That the sidewalks should not be used for storage purposes except as allowed by the ordinances.

3. That they should not be used for samples or goods exposed for sale.

4. That while they may be used for receiving goods, the goods should not remain upon the sidewalks beyond a limited time fixed by the public authorities.

5. That while shipping may be done across sidewalks, there should be a limit of time during which an obstruction can be continuously placed across them.

6. That the sidewalks should not be used as a shipping floor—that is, that goods to be shipped should not remain on the sidewalk contrary to the ordinances.

7. That the goods on the sidewalk at any time should not prevent a reasonable passageway for the passer-by.

8. That as no necessities of business require signs upon the sidewalks or projecting signs from buildings, these excrescences ought to be lopped off.

9. That so-called "business buggies" should not be allowed to stand on the streets.

Price-Lists, Circulars, &c.

THE GILBERT & BENNETT MFG. COMPANY, 42 and 44 Cliff street, New York, and 148 Lake street, Chicago, Ill., with factories at Georgetown, Conn., and Chicago: Wire Cloth, Netting and Fencing, Wire Goods and Wire Work. Their 1891 catalogue, No. 120, containing over 100 pages, is devoted to lists, illustrations and descriptions of their extended line of goods. They have made numerous improvements in their goods, and have added some new articles. The trade is advised that their facilities have been recently increased for manufacturing Wire, Wire Cloth, Netting and Fencing at their Connecticut works, and trust now to be able to supply all promptly. They derive satisfaction from the fact that they are able to make the Wire, to weave by automatic power machinery, to galvanize and to tin wire both in the strand and also in the fabric, thus enabling them to bring out, step by step, finished goods from raw material at the lowest cost. Their Chicago factory is referred to as well equipped to make a large line of goods, and also to execute orders for special work promptly.

KIECKHEFER BROTHERS & Co., Milwaukee, Wis.: Catalogue of 300 pages, handsomely engraved and substantially bound. The opening pages of the volume present front and rear perspective views of the Milwaukee Stamping Works of Kieckhefer Brothers & Co. The volume is divided into sections as follows: Pieced Tinware, Copper and Brass Wire, Black and Galvanized Sheet Iron, Deep Stamped Ware, Shallow Stamped Ware, Tinners' Stamped Trimmings, Miscellaneous Supplies, Japanned Ware, Granite and Agate Ware, Blue and White Enameled Ware, Perfection Granite and Agate Ware, Spoons, Wire Goods, Iron Goods and Miscellaneous Goods. The 300 pages are profusely illustrated and the cuts are of noticeable excellence. The printing is also well done, giving a finished and very attractive appearance to the book. Particulars of sizes and grades accompany the illustrations of the several goods, and the prefatory note of the manufacturers states that prices will be furnished in a separate pamphlet. In addition to the division into sections, all the goods are indexed alphabetically.

KIRWAN & TYLER, Baltimore, Md.: Cans, Machinery and General Canning House Supplies. In their catalogue of 120 pages the goods are classified in departments—Cans and Can Trimmings, Canmaking Machinery, Canning House Machinery and General Factory Supplies, General Supplies and Machinery. Estimates of the amount and cost of machinery are given for outfits of from 2000 to 20,000 cans capacity per day; also tabulated matter of service to those interested in the canning industry. The catalogue is very complete in its line, and as a reference book will be of much service.

Linsley's Wire Cloth and Netting Price Book.

F. J. LINSLEY, 33 Broadway, New Haven, Conn., has just published a Wire Cloth and Netting Price Book, a page illustration of which we give herewith. The book contains 16 pages, and is indexed so that any width of Cloth can be referred to readily. Each page is devoted to one width of Cloth or Netting, as follows: 12, 18, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 48, 60, 72 inches, figured out at ¾, 1, 2, 2½, 3 and 6 cents per square foot, which apply to Poultry Netting, painted and galvanized Wire Cloth. Costs at special prices can be figured out and entered in blank columns. Fractions of a square foot are figured to the nearest $\frac{1}{12}$, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$ or $\frac{1}{2}$. Fractions of a cent less than $\frac{1}{2}$ are not counted. Half a cent or more is counted as 1 cent. The way to get the cost of Cloth or Netting at $\frac{1}{2}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$ or $2\frac{3}{4}$ cents is also given. Referring to the usual manner of figuring Wire Cloth the author remarks:

How much time is spent and how many mistakes are made, in every Hardware store, figuring odd-sized pieces of Wire Cloth and Netting, many of which amount to but a few cents. Your customer becomes impatient or there may be others waiting, the clerk gets nervous and makes errors in his figures, which the purchaser discovers when upon reaching home he figures the thing for himself, finding, more than likely, that he has paid you too much for the goods. All this tends to create bad feeling and perhaps loses for you a good customer. On the other hand, you may not have charged him enough, causing a loss which you may never discover.

The book is the result of the need in the author's store of a list of Wire Cloth figured out in such a manner as to be quickly referred to, obviate mistakes and save valuable time. We are informed that it has proved of value in these directions, and it will doubtless be appreciated by the trade in general.

WIDTH. **34 In.** — Cents per Square Foot.

Length.	Sq. Ft.	¾	1	2	2½	3		6	
1 in.	1/24			.01	.01	.01		.02	
2 "	1/12		.01	.01	.01	.02		.03	
3 "	1/4	.01	.01	.02	.02	.02		.05	
4 "	1/3	.01	.01	.02	.02	.03		.06	
5 "	1 5/24	.01	.01	.02	.03	.04		.07	
6 "	1 1/2	.01	.01	.03	.04	.04		.09	
7 "	1 7/24	.01	.02	.03	.04	.05		.10	
8 "	1 1/3	.01	.02	.04	.05	.06		.11	
9 "	2 1/24	.02	.02	.04	.05	.06		.13	
10 "	2 5/24	.02	.02	.05	.06	.07		.14	
11 "	2 7/24	.02	.03	.05	.06	.08		.16	
1 ft.	2 1/3	.02	.03	.06	.07	.09		.17	
2 "	5 1/3	.04	.06	.11	.14	.17		.34	
3 "	8 1/2	.06	.09	.17	.21	.26		.51	
4 "	11 1/3	.09	.11	.23	.28	.34		.68	
5 "	14 1/6	.11	.14	.28	.35	.43		.85	
6 "	17	.13	.17	.34	.43	.51		1.02	
7 "	19 1/3	.15	.20	.40	.50	.60		1.19	
8 "	22 2/3	.17	.23	.45	.57	.68		1.36	
9 "	25 1/2	.19	.26	.51	.64	.77		1.53	
10 "	28 1/3	.21	.28	.57	.71	.85		1.70	
20 "	56 2/3	.43	.57	1.13	1.42	1.70		3.40	
30 "	85	.64	.85	1.70	2.13	2.55		5.10	
40 "	113 1/3	.85	1.13	2.27	2.83	3.40		6.80	
50 "	141 2/3	1.06	1.42	2.83	3.54	4.25		8.50	
100 "	283 1/3	2.13	2.83	5.67	7.08	8.50		17.00	
150 "	425	3.19	4.25	8.50	10.63	12.75		25.50	

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It Is Reported—

That the Hardware establishment of D. A. Burtis, Phœnix, Ariz., is undergoing considerable enlargement. Mr. Burtis has leased another store and proposes to have two commodious workshops as well as an increased wareroom space for the better exhibition of his extensive stock of Stoves, Hardware and Plumbers' Supplies.

That F. K. Nance, San Angelo, Texas, will open a new Hardware store shortly.

That W. R. Henderson has succeeded the Hardware firm of Miller & Henderson, Bessemer, Ala., and will continue the business at the old stand.

That the S. D. Peterson Implement Company, New Ulm, Minn., are closing out their businesss.

That E. R. Spindler, St. Paul, Minn., is about to dispose of his Hardware stock with a view to getting out of business.

That Samuel Shane will erect a building at McDonald, Pa., part of which will be used for his Hardware store.

That Andrew De Wolfe will open a Hardware store on Water street, St. Stephen, N. B.

That the Hardware store of John T. Lucas, Minneapolis, Minn., was burglarized on the 9th inst., and goods valued at several hundred dollars taken.

That Mr. Miller, Grand Rapids, Mich., recently suffered a loss of $5000 on his stock of Hardware by an incendiary fire. Mr. Miller has secured another building where he is again engaged in business.

That Adams & Rheinhart are a new Hardware firm at Grand Forks, N. D.

That the copartnership heretofore existing between Frank D. Crissman and Clark J. Crissman in the Hardware business at Alpena, Mich., has been dissolved. C. J. Crissman will continue the business at the old stand.

That David Jack will be the proprietor of a new Hardware store at Julian, Neb.

That Reeves & Brines have succeeded Pulaski Reeves, dealer in Agricultural Implements, Rushville, Ill., and will continue the business as heretofore.

That Stone & Davis, South Glens Falls, N. Y., have removed to their new quarters in Stewart's Block.

That C. A Baskerville, Winnipeg, Man., has removed his Hardware stock to the new three-story brick building which was recently erected for him.

That Page & Blair have succeeded the Hardware firm of Page & Martin, Correctionville, Iowa.

That the Hardware firm of Colby & Kittredge, 96 Richmond street, Boston, has been dissolved, Mr. Kittredge retiring. Mr. Colby has formed a new partnership with A. B. Rounds under the title of W. M. Colby & Co.

That Edwards & Schulte have purchased the Hardware stock of Dersch Bros., Oregon, Mo., and will continue the business at the old stand.

That Smith Bros., Hardware merchants, Eau Claire, Wis., were recently damaged by fire.

That the store of McKenny & Heard, Biddeford, Maine, was entered by burglars recently and several hundred dollars' worth of Knives, Razors and Scissors stolen.

That the Pacific Hardware Company, Tacoma, Wash., have been incorporated, with a capital stock of $30,000.

A Convenient Rack.

A. W. KUEKEN, 221 North Clark street, Chicago, is a wide-awake retail Hardware dealer, to some of whose advertising methods we have previously called attention. It is Mr. Kueken's constant study to devise plans by which to catch the eyes of his customers, and to a great extent make his goods sell themselves. Not only are his windows dressed frequently to attract the attention of people passing the store, but the internal arrangement of the store constantly presents some novel idea. One of the latest of these is a rack, as shown in the accompanying cut, holding a half dozen trays of goods of various kinds, with a price placard on each tray. The construction of the rack is simple and easily comprehended from the cut. In the top tray are cheap Corkscrews, Screw Drivers, Scratch Awls, &c., marked "only 5 cents each." In the second rack are slightly better tools of the same class, marked "only 8 cents each." The third rack holds Insect Guns, marked "only 10 cents each." The fourth holds Hammers, marked "only 10 cents each." The fifth holds Pincers, &c., marked "only 15 cents each." The bottom tray holds Vises, &c., marked "only 30 cents each." This rack stands near the door, catches the eye

A Convenient Rack.

of a person entering and causes many tools to be sold which would, perhaps, not then be called for. A plainly marked price seems to be a very strong point in the sale of a great variety of goods.

Exports.

FOR AUCKLAND.

By Coombs, Crosby & Eddy.—25 dozen Edge Tools, 6 Scales, 2 dozen Wringers, 4 dozen Churns, 190 pounds Bird Cages, 6 dozen Tinware, 13 dozen Hammers, 1½ dozen Meat Choppers, 16 dozen Locks, 3 Lawn Mowers, 3 dozen Bush Hooks, 1 dozen sets Sad Irons, 2 dozen Apple Parers, 12 dozen Tools.

By E. H. Patterson.—1 case Hardware.

By Edward Miller & Co.—22 packages Lamp Goods.

By McCoy & Sanders.—6 dozen Barometers.

By L. D. Crossmond & Co.—11 cases Agricultural Implements, 3 Levelers.

By Arkell & Douglas.—9 packages Lampware, 8000 Bolts.

By H. W. Peabody & Co.—1 case Guns, 10,000 Cartridge Shells, 2500 Cartridges, 25,500 Cartridges, 1 case Hardware.

By R. W. Forbes & Son.—1 gross Sad Irons, 1 case Hardware, 35 cases Tools, 6 cases Hardware, 9 dozen Lawn Mowers, 3 cases Carriage Bolts.

By Coombs, Crosby & Eddy.—59½ dozen Hardware, 4 dozen Axes, 12 dozen Agricultural Forks, 6 dozen Sash Cord, 1 dozen Letter Presses, 2 dozen Potato Hooks.

PER BARK VESNOIO, JUNE 4, 1891, FOR CAPE TOWN, SOUTH AFRICA.

By Hartley & Graham.—3000 Metallic Cartridges.

By Sherman & Lyon.—1240 pounds Wheelbarrows.

By W. B. Fox & Bro.—6 packages and 3 cases Agricultural Implements, 2 cases Edge Tools.

By Coombs, Crosby & Eddy.—1 dozen Churns, 18 Hay Cutters, 71 dozen Hardware, 1 Rope Reel, 3 dozen Ladders, 2 dozen Scales, 79 dozen Carpenters' Tools, 24 dozen Traps, 2 dozen Grindstones, 1 dozen Ladders, 2 dozen Meat Choppers, 1 Meat Cutter, 18 dozen Fruit Jars.

By W. H. Crossman & Bro.—40 cases Sash Weights, 12½ dozen Sash Cord, 1 case Hardware, 3 cases Carriage Hardware, 1 dozen Carpenters' Hardware, 7 gross Stove Polish.

SUPPLEMENTARY SHIPMENTS PER SHIP MACEDON, MAY 12, 1891, FOR SYDNEY, AUSTRALIA.

By the F. B. Wheeler Company.—6 cases Crayons, 1 tierce Lamp Fixtures.

By McLean Bros. & Rigg.—22 dozen Mattocks, 24 cases Lawn Mowers, 36 dozen Axes, 12 dozen Picks, 3 dozen Rope Reels, 7 packages Carriage Hardware, 4 dozen Planes, 6 dozen sets Sad Irons, 191 dozen Forks, &c., 24 dozen Egg Beaters, 6 dozen Braces, 27 dozen Saws, 22 gross Fruit Jars, 1 dozen Money Drawers, 36 dozen Pulleys, 40 gross Fruit Jars.

By Ilsley, Doubleday & Co.—224 pounds Pumice Stone, 2 cases Hardware, 8 dozen Hoes, 5 5-6 dozen Saws, 5 dozen Handled Axes, 1 box Hardware.

SHIPMENTS PER BARK STAR OF THE EAST, JUNE 2, 1891, FOR DUNEDIN, NEW ZEALAND (CONCLUDED).

By Rogers, Smith & Co.—21 packages Plated Ware.

By the F. B. Wheeler Company.—1 case Hardware.

By H. W. Peabody & Co.—6 packages Hardware, 4 dozen Cork Pullers, 2240 pounds Nails, 2 cases Plows, 3 cases Scales, 4350 pounds Nails, 3 packages Hardware, ½ dozen Wringers, 14 packages Hardware, 1523 pounds Nails, 9 dozen Forks, 27 cases Hardware, 1 case Sandpaper, 2 dozen Wringers, 6 cases Hardware, 1 dozen Wringers, 2 barrels Stamped Ware, 1 case Shears, 57 cases Fruit Jars, &c., 5 dozen Wringers, 5 gross Egg Beaters, 1 dozen Seed Sowers, 8 packages Hardware, 3 dozen Wringers, ½ dozen Wringers, 16 dozen Rakes, 1 dozen Hoes, 12 dozen Rakes, 1½ dozen Meat Choppers, 7 dozen Edge Tools, 9 packages Lawn Mowers, 2 packages Farming Implements, 2½ dozen Churns, 6 dozen Rakes, ½ dozen Wringers, 1 dozen Forks, 9 dozen Egg Beaters, 1 case Whip Sockets, 6 dozen Forks, 5 packages Hardware, 1 cask Pumps, 600 pounds Wire, 1 ton Barb Wire, 1 case Hardware, 1½ dozen Churns, 37 pounds Sash Cord, 1 dozen Mangles, 1 case Lampware, 1 case Pencils, 13 packages Stoves, 7 packages Hardware, 4 cases Axles, 280 pounds Nails, 391 pounds Bolts, 2 dozen Churns, 3 dozen Lanterns, 8 Stoves, 3 dozen Lanterns, 1 package Augers, 1550 pounds Horse Nails, 34 pounds Rubber Packing, 10 tons Barb Wire, 2 cases Carriage Hardware, 1 dozen Ladders, 1 case Razors, 1000 pounds Nails, 6 packages Hardware, 10 tons Barb Wire, 1 case Axles, 20 dozen Rakes, 2 cases Hardware, 4 cases Farming Implements, 3 cases Hardware, 10,000 Cartridges, 2000 Shells, 45 packages Lampware.

FOR AUCKLAND.

By Arnold, Cheney & Co.—1 case Oil Stone.

By A. S. Lascelles & Co.—4 bundles and 5 cases Farming Implements, 5½ dozen Agate-Ware, 1 Sheller 4 dozen Axes.

By F. B. Wheeler Company.—1 case Hardware, 12 cases Axes, 1 case Bolts, 2 cases Meat Choppers, 4 cases Axes, 4 crates Churns, 2 bundles Plated Ware, 1 case Plated Ware.

By H. W. Peabody & Co.—4 packages Hardware, 7 packages Lawn Mowers, 1 gross Lead Pencils, 1 gross Fly Traps, 1000 pounds Horse Nails, 1 case Picture Cord, 31 cases Fruit Jars, &c., 3 packages Lamp Goods, 1 case Wire Goods, 2½ dozen Wringers, 3 cases Traps, 3 cases Farming Implements, 20 dozen Hay Rakes, 40 packages Hardware, 1 case Farming Implements, 2000 pounds Nails, 1 case Oilers, 6 cases Axles, &c., 6½ dozen Churns, ½ dozen Plows, 36 dozen Edge Tools, 1 case Hay Knives, 82 cases Hardware, 1 case Emery Wheels, 5 cases Farming Implements, 21 packages Hardware, 6 dozen Apple Parers, 18 dozen Forks, 9 packages Hardware, 3 packages Pumps, 3 cases Axles, 14 packages Hardware, 4 packages Pumps.

FOR LYTTLETON.

By F. B. Wheeler Company.—1 case Lead Pencils, 1 case Bird Cages, 1 crate Step Ladders, 6 cases Hardware, 2 bundles Plated Ware, 2 cases Hammers, 2 cases Hardware, 7 cases Fruit Jars.

By H. W. Peabody & Co.—2 cases Forks, &c., 1 box Plated Ware, 2 cases Hardware, 2 dozen Wringers, 4 cases Stamped Ware, 1 case Bird Cages, 16 cases Fruit Jars, 18 packages Hardware, 1 case Pumps, 1 box Razors, 1 bale Cordage, 1 case Guns, 1 dozen Oil Stoves, 645 pounds Bolts, 1 case Traps, ½ dozen Seed Sowers, 6 dozen Thermometers, 1250 pounds Nails, 3 cases Hardware, 1 case Traps, 3 dozen Edge Tools, 1 case Sandpaper, 2 cases Axles, 2 cases Agricultural Implements, 12 cases Tacks, 4 cases Hardware, 200 reels Wire, 1 case Traps.

FOR DUNEDIN, LYTTLETON AND AUCKLAND.

By R. W. Cameron & Co.—2 cases Axles, 30 Pumps, 18 dozen Forks.

PER BARK VERMONT, JUNE 4, 1891, FOR SYDNEY, N. S. W.

By Coombs, Crosby & Eddy.—40 dozen Edge Tools, 65 dozen Bird Cages, 2 dozen Carpet Sweeper, 2 dozen Scales, 72 cases Fruit Jars, 87 Churns, 39 Freezers, 2 Milk Shakers, 10 gross Crayons, 18 dozen Wrenches, 10 gross Hardware, 6 dozen Tools, 146 dozen Hardware, 6 dozen Hoes, 5 dozen Tools, 66 dozen Hardware, 3½ gross Fruit Jars, 6 dozen Hardware, 147 dozen Tools, 46 dozen Traps, 63 dozen Hardware, 95 dozen Tinware.

By W. H. Crossman & Bro.—60 dozen Hardware, 39 dozen Hammers, 20 dozen Knives, 48 dozen Cages, 8 cases Hardware, 20 dozen Axes, 10 packages Hardware, 1 dozen Miter Boxes, 3 gross Egg Beaters, 6 sets Stocks and Dies, 9 Scales, 12 Shellers, 24 Corn Mills, 3 dozen Lawn Mowers, 300 pounds Iron Nails, 6 Bolt Clippers, 36 boxes Hardware, 27 dozen Cages, 24 dozen Hatchets, 9 packages Hardware.

By S. Hoffnung & Co.—5 dozen Tinware, 6 dozen Oil Cans, 1 dozen Corn Mills, 28 gross Hammers, 37 dozen Bird Cages, 101 dozen Tinware, 18 dozen Wrenches, 17½ gross Fruit Jars, 1 gross Lamp Goods, 2 cases Snaths, 1 box Wire Goods, 26 Tinware, 6 dozen Locks, 18 dozen Thermometers.

By Arkell & Douglas.—16 Lawn Mowers, 35,700 pounds Barb Wire, 24,000 Bolts, 2 barrels Hose, 28 dozen Snaths, 18 dozen Forks, 18 dozen Broilers, 12 cases Fly Traps, 6 dozen Tools, 30 dozen Brushes, 146 cases Fruit Jars, 150 dozen Axes, 179 reels Barb Wire, 2 cases Hay Forks, 2 cases Thermometers, 6 dozen Hammers, 2 cases Agate Ware.

By McLean Bros. & Rigg.—30 Rifles, 34 dozen Churns, 19 dozen Drills, 1 case Bolts, 12 dozen Scythes, 3000 Bolts, 4 cases Hammers, 35 dozen Axes, 2 Washers, 10 Hose Reels, 8 cases Brackets, Saws, &c., 3 cases Granite Ware, 2 Axes, 22,000 Cartridges, 14 dozen Wrenches, 1 case Revolvers, 5 cases Whetstones, 18 cases Agate Ware, 21 dozen Axes, 17 dozen Cow Bells, 1 dozen Lamps, 8600 Bolts, 135 pounds Hardware, 2900 Bolts, 30 gross Belt Studs, 8 gross Rat Traps.

By Edward Miller & Co.—117 packages Lamp Goods.

By Goulds Mfg. Company.—31 Pumps

By H. W. Peabody & Co.—10 packages Hardware.

By Collins & Co.—410 dozen Edge Tools.

By Australasian-American Shipping Company.—50 cases Reapers and 15 boxes Wheels, 8 cases Hammers, 4 cases Reaper Parts, 65 cases Axles, 1 barrel Hardware.

By the F. B. Wheeler Company.—43 cases Axes.

By R. W. Forbes & Son.—1 case Wire Goods.

By Simpson, Hall, Miller & Co.—26 packages Britannia Ware.

By Edward Miller & Co.—5 boxes Lamp Goods.

By W. K. Freeman.—7 cases Axles.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The distribution of goods in this line has proceeded about the same as usual during a "heated period." In some quarters contiguous to this market building operations have been pushed forward with considerable vigor, more or less to the advantage of Paint manufacturers and jobbers. The local demand, to all accounts, has not fully met expectations, yet the volume of business is in flattering contrast with that of the preceding week, and the aggregate movement makes a good showing. In the markets for crude materials no changes have taken place that would tend to affect values of the various pigments in any marked degree, nor does competition appear to have exceeded ordinary bounds. In point of fact, steadiness of values nearly all along the line is still a conspicuous feature of the market, and the outlook is free from signs of radical variations in the immediate future.

White Lead.—To all accounts the distribution of this pigment has been on a somewhat more liberal scale than during the week preceding the one under review. Jobbers have had a better run of small orders from the nearby and local trade, and manufacturers of both pure pigment and the various lines of cheaper product express satisfaction with the orders received. As to prices, there is no change to note. Corroders adhere to the official list, in the absence of troublesome outside competition, and mixed Lead manufacturers make no fresh concessions. Jobbers still take orders at variable prices, but, as far as can be learned, make no greater concessions than have been frequently granted of late. There are no signs at this writing of contemplated changes in prices by the White Lead Trust; and, in the absence of aggressive action in that quarter, no radical movement is likely to occur elsewhere.

Zincs.—The movement of American Oxide in delivery on back orders continues free, and new business, while not in excess of the average for this season of the year, appears to be fully up to expectations. Little or no accumulation of supplies takes place and prices remain very firm. The importation of foreign brands is closely absorbed at former figures.

Colors.—The movement of Dry Colors has been on a moderate scale, yet somewhat freer than during the preceding week and fully up to the average for the season. Trade in Oil Colors is fairly satisfactory. Prices have undergone very little change during the week and the market generally is steady, with no conditions suggestive of any radical changes in the immediate future. Somewhat better demand for Paris Green is noted, but purchases are chiefly of moderate quantities needed to tide over immediate wants.

Miscellaneous.—No new features have developed in the market for Block Chalk. The demand at present is moderate and the offering unimportant. Whiting sells quite freely, but at irregular prices. Paris White is steady and meeting with very fair sale. Putty is still irregular in price and meeting with about usual demand.

Oils and Turpentine.

There have been very few and only unimportant changes in the market for animal and vegetable Oils. More or less interest is manifested in the Menhaden Oil combination by home consumers and exporters, but the working arrangements are still in uncertain shape, and the outcome is problematical. The Linseed Oil situation is practically the same as it was a week ago, with more or less uncertainty as to the future; yet no sign of any aggressive movement by the trust and allied interests or outside crushers. In other lines ordinary conditions are not interfered with to any marked extent, and the latter are not such that would stimulate action on the part of either buyers or sellers, and therefore have little effect upon values.

Linseed Oil.—Local crushers report a freer movement of their product, with individual orders fully up to the average size for this season of the year, and the distribution satisfactory. The condition of the market for raw material is such that watchful buyers do not abandon all hope of lower prices in the near future, and there is still enough outside competition in the West to cause uneasiness. It does not appear, however, that any concessions on the inside figures named a week ago have been made by sellers of out-of town brands, and finding no reason for making any "cut," local crushers adhere to former prices.

Cotton-Seed Oil.—In the crude product there has been little doing. Buyers are still very conservative, and holders not only offer sparingly, but assert that supplies are moderate and closely controlled. Prices stand practically as they were a week ago. Exporters have taken a few hundred barrels of first-class refined product, chiefly butter quality, and moderate quantities of "off" grade, but the home trade is without signs of improvement in any particular. There is no visible change in the position of supplies, nor indication of radical movement in values right away.

Lard Oil.—A fairly large business in prime quality oil was effected at the lower range of prices noted last week, and this movement, coupled with an upward turn in the cost of raw material, has imparted more tone to the market. At the present time city pressers are naming 53¢ as an inside price for best brands and sellers of outside brands rarely go below 52¢. The lower grades are steady at former figures.

Menhaden Oil.—Nothing new has transpired regarding the combination of crude Oil manufacturers. To all accounts the home selling agency of the product of all but a few factories has been placed in the hands of one broker and arrangements made to centralize the export business. In some quarters it is claimed that the fishing has been rather poor thus far this season, but elsewhere the report is that a good catch has been made and that the prospects are favorable.

Sperm and Whale Oils.—Outside of the sale of a moderate quantity of Whale Oil, recently at hand by sailing vessel from San Francisco, there has been no movement in crude product. The manufactured Oils are moving in merely routine way and at the prices that have ruled for some time past.

Miscellaneous.—The market for Olive Oil in barrels is a shade firmer, with no offering of other than doubtful quality stock at less than 68¢ @ 70¢, and the demand fair. Cocoanut Oils are barely steady at last week's prices and moving rather slowly. No further change on Tallow Oil.

Stein & Schwarz of Philadelphia have been appointed agents for the Schuechtermann & Kremer coal-washing plants, of which 270 are in successful operation and in numerous case have taken the place of other more complicated systems, for briquette machinery; for the E. Bernard modification of the Coppée (Belgian) coke oven with or without saving of by-products and for Boeker's hot blast stove, adjustable tuyere stock arrangement and gas regenerative system for boiler use. They also handle Koeingswarter & Ebell's tungsten (wolfram) metal and alloys and other steel specialties. They have already orders for two coal-washing plants of large capacity, and since the necessity of cleaning the coal before coking becomes more recognized every day, particularly in the South and West, they expect to be very busy in this particular line. Boeker's patents have been fully described in Dr. Wedding's paper read before the International Meeting of the Engineers in October of last year. They have now under construction two blast furnace plants, two coal-washing and one coking plant and several orders of smaller importance.

Steel Coal Shutes.

R. K. Teller, Unadilla, N. Y., is offering the trade coal shutes, as illustrated herewith. The window shute, Fig. 1, tapers, and is made 5, 6, 7, 8 and 9 feet

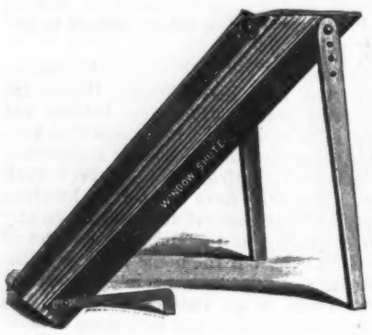


Fig. 1.—Window Coal Shute.

long, being 24 inches wide at the large end, and is supplied with folding legs and window stop. The telescope shute, Fig. 2, is arranged with an extension piece that slides over the outside of the straight section. These are made in three sizes, making available lengths from 8 to 20 feet. This allows the shutes to be adjusted to

Fig. 2.—Telescope Shute.

any desired length within the limit of extension. The taper wagon shute, Fig. 3, is 21 inches wide at the large end, and tapers gradually to a width of 12 inches at the other, made 8, 10 and 12 feet long. Crooks are supplied, not shown in the illustrations, to be used on the small end of shutes for discharging coal to the right

Fig. 3.—Taper Wagon Shute.

or left of a window. The manufacturer describes the shutes and their advantages as follows:

These shutes are made from one piece of tough sheet steel without seam or rivet, and with all raw edges strengthened by being folded. They are therefore light, cheap and durable. The shutes present so smooth a surface that the coal slides over them freely when inclined at but a slight angle and with sufficient force to discharge itself against the further side of the coal bin, thereby saving the time and labor of stowing away the coal. Another advantage of the steel shutes is that a sufficent length can be used to enable one to discharge coal from his wagon over fences, across lawns, walks, &c., and even around the corners of buildings.

Buhl Tilt Lantern.

Buhl Stamping Company, Detroit, Mich., are putting on the market a tilt lantern, as illustrated herewith. The advantages of this lantern will be appreciated when it is stated that it can be filled, lighted and regulated without removing the globe. Attention is directed to the locking device for holding the globe in place, as unique, durable and easily operated. These lanterns are referred to as being manufactured from the best of material and neatly finished.

Buhl Tilt Lantern.

The Twentieth Century Razor.

A new razor named as above has recently been put on the market by A. J. Jordan, manufacturer of the well-known AAA1 brand of cutlery, St. Louis and Sheffield. This name is given it, we are advised, as indicating its superior quality, the makers wishing it to carry the implication to the mind of the purchaser that the razor in question is a full century in advance of the razors at present made. The trade-mark has been duly registered. We are informed that the finest English steel obtainable is used in its manufacture, and that every razor will pass through a rigid examination before it will be allowed to pass out of the factory. The razors are made in pearl, shell, ivory and hard rubber handles in various sizes, and are put up in individual scabbards made of leather neatly decorated and marked with gilt. We are advised that this razor is not to be sold in competition with the cheap razors on the market, but at a price which gives a fair return for the money invested, and it is put in competition with the finest goods offered to the trade.

Tate's Picture Cord Holder.

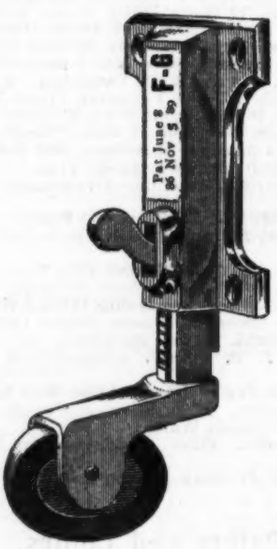
Tate & Co., Malden, Mass., are putting up their braided wire picture cord in a novel holder, as illustrated herewith. This consists of strips of tin ⅜ inch wide, fastened at the points where they cross by eye-

Tate's Picture Cord and Holder.

lets. The eyelets serve as openings, through one of which the end of the wire is passed. The holder is referred to as indispensable to the retailer as well as to the consumer, as the quantity and quality of the wire can be seen, and because it is so constructed as to render it impossible for the inclosed cord to become entangled or snarled.

F. G. Door Check.

F. G. Mfg. Company, 78 Dearborn street, Chicago, are introducing a door check, as illustrated herewith. It consists of a foot bolt like device, with a rubber bumper attached to the lower end. The following claims are set forth by the manufacturers: That it will hold the door firmly in any position, open or closed; that it regulates the draft, giving air and keeping small children in the house; that it prevents slamming of doors and the



F. G. Door Check.

breaking of glass and plaster; that it can be set or released with the foot without stooping, and is never in the way. The rubber foot acts as a bumper, keeping the door knob from striking the wall, and does not wear the floor or carpet. The point is made that the check can be set as a dead lock at night, and that it cannot be picked or forced without breaking the door. Attention is directed to the fact that it operates instantly and is always ready. It is fastened at the bottom of the door, so

that when the check is closed the rubber foot will swing from ¼ to ½ inch clear of the carpet or floor.

P. & C. Hub Boring Machine.

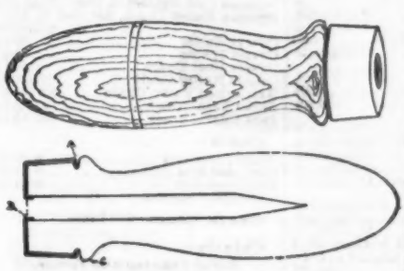
Butts & Ordway, 145 and 147 Pearl street, Boston, are introducing a hub borer, as illustrated herewith. The boring is done from the front to the back, with no change or removal of the wheel until the hole is complete for the box. The clamping on the hub of the wheel allows

P. & C. Hub Boring Machine.

the use of a crank handle instead of auger handle, thereby saving much time. The manufacturers claim that the machine has strength, durability and convenience combined; that it is not complicated, but simple, and can be operated at sight; that it is not liable to get out of order; that it is self centering, and will center on any hub up to 12 inches in diameter; that the box may be driven or pressed in, requiring no wedging; that it requires but little space when not in use; and that the wheel being rigidly clamped by the small end of the hub, the machine will instantly center and true any wheel. The point is made that it is fitted for both light and heavy work, doing both equally well, and that it has a patent feed nut whereby the mandrel can be drawn back when bored to the proper depth instead of turning back. The machine is referred to as turning off satisfactory work rapidly.

Fire-Proof Soldering Iron Handle.

The Cleveland Rule and Handle Company of 10 Bolivar street, Cleveland, Ohio, are placing upon the market their im-



Fire-Proof Soldering Iron Handle.

proved patent fire-proof soldering iron handle, designed for the use of tinners, plumbers and sheet-metal workers. The handles are made under Donoghue's patent, and are offered in two sizes. The smaller, which is 5½ inches long, is intended for 1, 2 and 3 pound coppers, while the larger, which is 6 inches long, is intended for 4, 5 and 6 pound coppers. The handles, a general and sectional view of one of which is shown in the accompanying illustration, are made with a tin ferrule cap, which covers the end of the handle, thus preventing it from burning. In order to keep the ferrule from coming off or becoming loose, it is turned down at the back end into a groove in the handle, as shown at A in the sectional view. It is also turned in around the tang of the iron where it enters the handle, as shown at B. The shoulder or bead C on the handle keeps the hand from coming in contact with the ferrule. In order to put a handle on the iron without splitting, the tang is first heated to a bright red, and when the copper is screwed up in a vise the handle is driven on gently with a mallet until the bottom of the hole bored in the handle is reached. It is then immediately driven off and the tang cooled before the handle is finally replaced. The manufacturers state that they are in a position to meet any demand for these goods, which are kept in stock by some of the prominent sheet-metal houses of the country.

American Knife Sharpener.

Mossberg Mfg. Company, Attleboro, Mass., are introducing a knife sharpener, as illustrated in Fig. 1. It consists of two hardened steel disks mounted on a ja-

Fig. 1.—American Knife Sharpener.

panned cast-iron base Screws passing through brass washers and the disks hold both firmly in place. The sharpener may also be used for sharpening scissors, as shown in Fig. 2. The advantage claimed

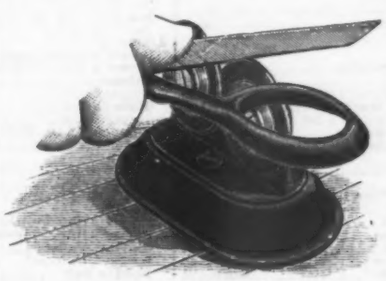


Fig. 2.—Used for Sharpening Scissors.

for the sharpener is the proper adjustment for the steel cutter, also the unlimited points of contact which may be obtained. It will be seen that when the disks become dull at any point a new cutting edge may be obtained by turning the disks very slightly. The point is made that when one side is worn out the disks can be turned over and the other side used. The sharpener is fastened by a screw to a table, shelf or other convenient place and is used for putting an edge on carving and bread knives, shears and scissors. The manufacturers claim that the steel cutters are easily adjusted and that they work perfectly.

Kirwan & Tyler, Baltimore, Md., are directing the attention of the trade to the Clark Perfection kerosene oil heating system, for the use of canners, can makers and tinware manufacturers. In connection with this system of burners they are using a square brick-lined fire pot, which is made both single and double, with openings for large or small coppers or steels. The manufacturers claim that the brick lining in this fire pot retains the heat, thus making a great saving in fuel.

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CURRENT HARDWARE PRICES.

JUNE 17, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' Prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobber, at the figures named.

Adjusters, Blind.

Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20&20&10%

Ammunition.—

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 57¢
Eley's D Waterproof, Central Fire..$1.00

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting.....15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. E. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Shells—
First quality 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....55&2%

Shells Loaded—
Standard List, July 19, 1890, 40&10&10@40&10&10&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up..	68¢
U.M.C.&W. R. A.—B. E., 9&10..	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.& W.R.A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R. A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....	$1.75
Eley's P. E., 11@10.....	2.80

Dis. 30&5

Anvils.—

Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11@11½¢
Armitage's Mouse Hole.....10½@11¢
Armitage's Mouse Hole, Extra...12@12½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.
Rockford Bit Company
Cook's, Douglass Mfg. Co.
} 70&10%

Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 33⅓ quarters, No. 5, $5; No. 30, $3.50.30%
Lewis' Patent Single Twist.....46%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits.....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $24₩.35@35&5%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $36; No. 2, $25.....35%
Stearns' No. 2, $48.....30%

Gimlet Bits—
Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.10.....25&10%
Ives.....25@35&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives.....
French, Swift & Co.....
} 33⅓@33⅓&10%

Douglass'
Bonney's Adjustable, ₩ doz $48....40&10%
Stearns'.....30&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₩ gr $1.70, 35%
Awls, Should. Peg, ₩ gr $2.45, 40@40&10%
Awls, Pat. Peg...₩ gr 68¢.....40@40&10%
Awls, Shouldered Brad..2.70 ₩ gr.....35%
Awls, Handled Brad...$7.50 ₩ gr.....45%
Awls, Handled Scratch ₩ gr, $7.50.35&10%
Awls, Socket Scratch, ₩ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—

No. 1, 4¼@5¢, No. 2 5½@6½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
} 3% cash

Concord Axles, loose collar.....5¢@6¢
Concord Axles, solid collar.....6¢@7¢
National Tubular Self-Oiling.....33⅓@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz	$0.80	0.95	1.75 net
Chatillon Straight Balances			40%
Chatillon Circular Balances			50&10%

Bars.

Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¼-inch, $8; 12-inch, $2.25; 13¼-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....30%

Bells—

Cow—
Common Wrought.....60&10%
Western.....30&10%
Western, Sargent's list.....70&10%
Kentucky "Star".....30&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10&50&10&5%
Call.....40@40&5%
Farm Bells.....₩ ℔ 2¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barlow's.....60&25&50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric.
Wollensak's.....20%
Bigelow & Downe.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....55&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10&5%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889.....70@70&5%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Boards, Stove.

Wood Lined "Crystal".....50%
"Embossed".....50%
"Oxidized".....45%
Paper Lined Zinc.....55%
"Crystal".....55%
"Embossed".....55%
"Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890.....75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush. Com'n " ....55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....35⅓&35%

Borax.....₩ ℔ 9½@10¼¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....3¾¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 1, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5&50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....50&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....50&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

	9	10	9x11
Henis' Self-Basting. { Inch			
{ Per doz	$4.50	5.50	6.50
New Haven			.50%
Wire Goods Co.			.65&10%

Buckets, Well.

Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Il Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Japanned, Plated Tips.
} .70&10@75%

Wrought Steel—
Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c.
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
} .70&10@75%

Bronzed Wrought Butts.....10%

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers, Can.

Cards—List January 28, 1891.

Watson's Cotton, Wool, Horse and File.....25%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed.....
Plate.....
Shallow Socket.....
} Brass....55@55&10%
} Others...60@60&10%

Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phoenix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains. List revised April 21, 1890.....60@ 60&5%
American Coil, in cask lots.

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½@¾¢ ℔.
German Coil, list Oct. 6, 1890...60@60&5%
German Halter Chain, list Oct 6, 1890 60@60&5%
Covert Halter.....60&5%
Covert Traces.....25@25%
Covert Heel Chain.....50&5%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 5½@6¢
Jack Chain, Iron.....75&10&50%
Jack Chain, Brass.....75@75&10%

Chalk—

White, case lots.....₩ gr 50¢
Red, case lots.....₩ gr 67¢
Blue, case lots.....₩ gr 75¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.
New Haven
Witherby
Mix
Ohio Tool Co.
} ..75 @ 75&10%

Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....50&10@50&10&5%
L. & I. J. White.....50@30&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$9 to $
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16¢

Chucks—

Beach Pat.....each, $8.00.....30%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal..$4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal. $3.25.

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....10&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Parallel, C. H. Besly & Co.....35%
Warner's.....40&10@40&10&2%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....30&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....60%&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....30%
Perfect.....50%
Kellogg's.....50&10
Sweet & Clark's.....50&10

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....50%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.

Common.....₩ lb 10@11¢
Patent, good quality.....₩ lb 13@13½¢
White Cotton Braided, fair..₩ lb 26@27¢
Common Russia Sash.....₩ lb 13½¢
Patent " .....₩ lb 15¢
Cable Laid Italian Sash.....₩ lb 22@23¢
Indian Cable Laid " .....₩ lb 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White.....28@30%
B Quality, Drab.....31@33%
C Quality, White (only).....26@27¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab, 39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢...30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cot'n Braided, White, ₩ lb 5...28%

Wire Picture.

Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr. $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr. $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—

Meat.

Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$20.00

Woodruff's ₩ doz.....40&5%

Nos.	100	150
	$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$3	$3.50	$4	$5	$15

Great American Meat Cutter.....30%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$3.50	$4.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$90	$225

.....30@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50¢
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....30@30&5
Ratchet, Whitney's.....30&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...35@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....30&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.70@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....30@30&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60. .....60%&10&10%
P. S. & W.....70%
Knapp & Cowles:
No. 1.....60&10@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos, 4 and 00, Acme and Ideal..50& 5@50&10&5%
Stearns'.....35&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet.25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ lb	4½¢	5 ¢	3½¢
½ kegs, ₩ lb	4¾¢	5¼¢	3¾¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6¼¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....50%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....60&10@60&10&5%
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported—

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List..65&5@65&10%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons.. 33⅓&@ 33⅓&10%
Stearns' Frames and Corners..25@35&10%
Cortland.....40@40&5%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....55@55&5%
Shepard's Lightning.....65@65&5%
Gem.....6⅔%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10&10%
Bone and Vet.....60&10&10%
Keystone, P. D. & Co., each, $1.50....30%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10 ⅔; 2 to 5 gro., 20 ⅔; 5 to 10 gro.....30 ⅔
Copper, 1 to 6 doz., 15 ⅔; 6 to 12 doz., 20 ⅔; over 12 doz.....25 ⅔

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 8.50

Fuse— ₩ 1000 ft.
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 3.80
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.85
Triple Taped Fuse, for very wet gr.. 5.90
Small Gutta Percha Fuse, for water. 7.80
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75&10&5@30%
Stebbin's Genuine.....60@10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....30&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....50&10&5%
" Eureka " Gimlets.....40&10%
" Diamond " Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45&10&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
" Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@9.00
Family, Cleveland Stone Co.....20 ⅔

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short..$1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top..₩ gr $10.00...45&10%
Pat. Peg, Leather Top.₩ gr $12.00.45&10%

Halters.

Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Ties. 50&2%
Covert's Jute Horse and Cattle Ties. 60&10&2%
Covert's Adj. Web Halters.....35&2 ⅔

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....35&10@
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....50@50&10%
C. Hammond & Son.....
Verree.....
Fayette R. Plumb.....
'Artisans' Choice," A. E. Nail.40&12½%
Regular "Y. & P." A. E. Nail .10%
Horseshoe Turning Hammers .50%
Other Hammers.....50. 10%
Hartford, Nail Hammers.....40&5&2%
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.20, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 lb and under.. ....₩ lb 40¢
3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢ }
Wilkinson's Smiths.....10½¢@11½¢₩ lb

Handcuffs and Leg Irons—See Police Goods,

Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 13¢; No. 6, 16¢; No. 2 and No. Reversible, 18¢.

Cross-Cut Saw Handles—

Boynton's Loop Saw Handles, 50¢....50%
Champion.....15%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3
Per doz.	$0.80	1 00	1.25	1.35	1.50

60@10&1 %

Boggin's Latches.....₩ doz 30@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₩ doz $1.40..... 10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd... ₩ gr 5.00
Apple Firmer Chisel, large... ₩ gr 6.00
Socket Firmer Chisel, ass'd... ₩ gr 3.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
} 30@35% ₩ gr
I. S. Smith & Co.'s Fat File.....50
File, assorted..... ₩ gr 7 75
Auger, assorted..... ₩ gr 5.00 .....50%
Auger, large..... ₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass..... ₩ set $1.25
Pat. Auger, Swan's..... ₩ set $1.00
Hon. Rake, Shovel, &c..... ....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2½
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft. 10¢.....50 &15&60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00.....20%
Eclipse.....20&10%
Felix, ₩ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....60&5@50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..30&10@25&10%
Warner's Pat.....30&10@20&10&10%
Stearns' Anti-Friction.50&10@20&10&5%
Stearns' Challenge.....35&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap35&5%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....40%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10 @ 50&5 %
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent & Co.....
P. S. & W. Co.....
Tea Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parzer.....75&2%
Palmer.....50&5&10%
Saymour.....70&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@30%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 19.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Geauine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10@2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50. .....10%

Gate Hinges—

Western.....₩ doz $4.40, 60%
N. E.....₩ doz $7.00, 55%
N. E. Reversible.....₩ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ doz $5.00, 55&10%
Automatic.....₩ doz $12.50, 50%
Common Sense.....₩ doz pair $4.50, 50%
Saymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₩ doz $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Sear's Spring Hinge Co.'s list, March 1886.....30%

Acme.....30%
O. S.....35&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Suckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%
Niagara, Holdback pattern, per gross.....$14.00

Wrought Iron Hinges
List February 14, 1891.
Strap and T.....50&10%
Corrugated Strap and T.....50 & 10 %
Screw Hook and Strap..... { 6 to 12 in., ₩ lb., 4¢ / 14 to 20 in., ₩ lb. 3½¢ / 22 to 36 in., ₩ lb., 3¢
Screw Hook and Eye.... { ½ in., ₩ lb 7½¢ / ⅝ in., ₩ lb 5½¢ / ¾ in., ₩ lb 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges (8, 10 & 12 in., ₩ lb.....5¢
"Providence" { over 12 in., ₩ lb.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. } 50&10&5 @60%
Am. Axe and Tool Co., S. & O. Pat. }
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....65&5@65&10%
Planter's, Cotton &c.....65&5@65&10%
Warren Hoe.....60%
Magic .....₩ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ doz $18.....60%

Bit.

Extension,
Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.....₩ doz $24.00, 40%
Angular.....₩ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₩ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.
} 60&10&10%

60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.60&10@50&10&10%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks).
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....50@50&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....50&10@50&5%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 lb. $2.30@$2.40
Self-Heating.....₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Mrs. Pott's Irons.....50&5%
Enterprise Star Irons.....50&2½
XX Cold Handle Sad Iron .....50&5%

Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₩ lb.....3 @ 3½¢
Combined Fluter and Sad Iron, ₩ doz. $15.00.....15%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33½ %
National Self-Heating.....50 %

Soldering—

Soldering Coppers.....₩ lb 22 @ 23¢
Covert's Adjustable, list Jan. 1 1880. 25&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....33⅓%
Victor.....33⅓%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AAA1, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn Auburn Mfg. Co. Crescent....$3.50
Corn
Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby.....
P. S. & W.....
Mix .....
New Haven.....
} ..75 @ 75&10 %

Merrill .....60&10@60&10&5%
Douglas .....75@75&5%
Watrous.....15&10@20%
L. & L. J. White.....50&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning...Mfrs'. price ₩ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40@7½@40&10%
Carter's Needle.....₩ doz $11.00@$11.50
Heath's.....₩ doz $13.00@18.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay .....₩ doz.$7.00 @ $8.00

Mincing.

Am. (2d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₩ doz $3.00 .25%
Buffalo Double Adj'table.₩ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60@10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....30&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&2%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 30¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladies.—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₩ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ doz.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards..... ....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular..... ₩ doz $3.60
3-inch Bull's-eye Police regular ..... ₩ doz $3.90
3½-inch Bull's-eye Police flash light .... ₩ doz $4.00
3-inch Bull's-eye Police flash light .... ₩ doz $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....60@&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronsed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2½
Brass. Real Bronze or Nickel Plate .30%

Excelsior.....50&10&2½
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 4 0 No. 1, $6.50; No. 2, $7.00; No. 3, ..50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 12 20 100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33½&2%
Deits, Nos. 36 to 39.....40%
Deits, Nos. 51 to 63.....40&10%
Deits, Nos. 86 to 96.....30%
Stoddard Lock Co.....50&20%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889. } 65&10@7[illegible] % Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88.
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deits Flat Key.....50%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....35%

Padlocks—

List Dec. 23, '84.....75&10%
Brittan, Graham & Mathes.....75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....35&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deits.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₩ doz, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....20@20&10%
E. T. Fraim's Keystone Scandavian. Nos. 119, 120, 130 and 140.....20&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....30%
Slaymaker Barry & Co.
No. 1010 line.....35&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr.. .33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886. 50&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....35&33⅓%
Reading.....65%&10@65%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'sed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....50%
Kempshall's Gravity.....50%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@50&10%
Hugunin's Sash Balances.....35&2&2%
Hugunin's New Sash Locks.....35&2&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10@5%
Lieseche's, No. 100, ₩ gr $8; 106, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₩ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75	50%
Snell's, blue's Pat.	5.50	6.75	40&10&10%
Jennings	5.50	6.75	45@45&10%
Other Machines...	2.25	2.75	
Phillips' Patent with Augers	7.00	7.50	
Miller's Falls.....	7.50		25%

Bluting.

Knox, 4½-inch Rolls .....$3.25 each } 35% Knox, 6-inch Rolls.....$5.00 each }
Eagle, 3½-inch Roll, $2.15..... .....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each 35%
Crown Jewel 6 in .....$5.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter .....each, $1.50
Geneva Hand Fluter, White Metal ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₩ doz 15 80..... .....40%

Shepard Hand Fluter, No. 110 ₱ doz $11.00 ..... 40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00 ..... 40%
Clark's Hand Fluter ₱ doz $15.00 ..... 35%
Combined Fluter and Sad Iron, ₱ doz $15.00 ..... 30%
Buffalo ₱ doz $10.00 ..... 10%

Hoisting—
Moore's Hand Hoist, with Lock Brake 20%
Moore's Differential Pulley Block 40%
Energy Mfg. Co's 25%
Sure Grip Steel Tackle Blocks 25%

Washing—
Anthony Wayne, ₱ doz No. 1, $51; No. 2, $45; No. 3, $42
Western Star, ₱ doz No. 2, $45; No. 3, $48.

Mallets.
Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. ..... 30@30&10%

Mattocks. Regular list. ..... 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat

Menders, Harness—
Per doz. $2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888 ..... 60&2%
American, Enterprise Mfg Co. ..... 20&10@30%
The Swift, Lane Bros ..... 20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.
Pennsylvania New Model, Excelsior, Continental, &c ..... 60@60&5%
Philadelphia ..... 60&10%
Perfection ..... 60&10&10%
Easy ..... 60&10@60&10&5%
Other Machines ..... 60&10&5@70%

Muzzles—
Safety ..... ₱ doz, $3.00, 25%

Nails.
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89 ..... 75&10%
Tack Mfrs.' list 70%
Wire Nails, Standard Penny.
Card June 1, '89, base ..... $2.20 @ $2.35

Horse—

Nos.	6	7	8	9	10
Ausable	.28	26	25	24	23

40&5&5&2%

Clinton, Fin.	19	17	16	15	14
Essex	.28	26	25	24	23

40&5&5&2%

Lyra	.19	17	16	15	14
Snowden	19	17	16	15	14
Putnam	.23	21	20	19	18

1000 ₱ in year 15%

Vulcan	.23	21	20	19	18
Northwest'n	.25	23	22	21	20

25@25&5%

Globe	.23	21	20	19	18

20&5&5%

Boston	.28	21	20	19	18

20&5&5%

A. C	.25	23	22	21	21

25&10@33½&5%

C. B.-K	.25	23	22	21	21

25&10@33½&5%

Maud S	.25	23	22	21	21

40&10%

Champlain	.28	26	25	24	23

40&10&10%

Saranac	.23	21	20	19	18
Champion	.25	23	22	21	20

.30&10%
10&10&10%

Capewell	.28	26	5	24	23

35&5@35&10%

Star	.23	21	19	19	18

10&10@10&12½%

Anchor	.23	21	20	19	18
Western	.23	21	20	19	18

.35%
.40&10%

Empire Brossed ..... 14 ₱ b.

Picture—
Brass Head, Sargent's list ..... 50&10&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.40¢	6.00¢ off list.
Cold Punched	5.00¢	5.10¢ off list.

In packages of 100 ₱, add 1-10¢ ₱ ₱, net; in packages less than 100 ₱, add ½¢ ₱ ₱, net.

Oakum—
Best or Government ..... ₱ ₱ 7@7½¢
U. S. Navy ..... ₱ ₱ 6@6½¢
Navy ..... ₱ ₱ 5½@6¢

Oilers—
Zinc and Tin ..... 65&10@70%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 50%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₱ gro, $2
Steel, Draper and Williams 50%

Openers, Can.
Messenger's Comet ..... ₱ doz $3.00, 25%
American ..... ₱ gross $3.00
Duplex ..... doz 25¢, 15@20%
Lyman's ..... ₱ doz $3.75, 20%
No. 4 French ..... ₱ doz $2.25, 55@60%
No. 5, iron Handle ..... ₱ gr $6.00, 45@50%
Eureka ..... ₱ doz $2.50, 10%
Sardine Scissors ..... doz $2.75@3.00
Star ..... ₱ doz $3.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50- 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50 ..... 40%
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 ..... 50&10%
Universal, ₱ doz $3.00 ..... 55&5%
Domestic, ₱ doz $2.50 ..... 45%
Champion ₱ doz $2.00 ..... 50%

Packing, Steam—
Rubber—
Standard ..... 60&5@65%
Extra ..... 50@50&5%
N. Y. B. & P. Co., Standard 50%
N. Y. B. & P. Co., Empire 60%
N. Y. B. & P. Co., Salamander 35%
Jenkins' Standard. ₱ ₱ 80¢ ..... 35@35&5%

Miscellaneous—
American Packing ..... 10¢@11¢ ₱ ₱
Russia Packing ..... 14¢ ₱ ₱
Italian Packing ..... 13¢@14¢ ₱ ₱
Cotton Packing ..... 15¢@17¢ ₱ ₱
Jute ..... 7¢@8¢ ₱ ₱

Padlocks—See Locks.

Pails.
Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75	
Heiwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets, see Well Buckets.

Indurated Fibre Ware—25%
Star Pails, 12 qt ..... ₱ doz $5 40
Wire, Stable and Milk, 14 qt .. ₱ doz $7.80

Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.
Dripping.
Small sizes ..... ₱ ₱ 6½¢
Large sizes ..... ₱ ₱ 5½¢
Silver & Co. (Covered) 40%

Pie—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods ..... 75@75&10%
Acme Fry Pans ..... 60&10%

Dust—
Steel Edge, No. 1 ..... ₱ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886 ..... 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Parers.
Apple.
Advance ..... ₱ doz $4.75
Baldwin ..... ₱ doz 5.25
Bonanza ..... each 5.00
Champion ..... ₱ doz 7.25
Daisy ..... ₱ doz 4.00
Dandy ..... each 7.50
Eureka, 1885 ..... each 16.00
Family Bay State ..... ₱ doz 12.00
Favorite ..... ₱ doz 5.00
Gem ..... ₱ doz 5.25
Gold Medal ..... ₱ doz 4.00
Ideal ..... ₱ doz 4.00
Improved Bay State. ₱ doz $7.00 @ $9.00
Little Star ..... ₱ doz 4.50
Monarch ..... ₱ doz 13.50
New Lightning ..... ₱ doz 5.50
Oriole ..... ₱ doz 4.00
Penn ..... ₱ doz 4.00
Perfection ..... ₱ doz 4.00
Pomona ..... ₱ doz 4.00
Rocking Table ..... ₱ doz 6.00
Turntable ..... ₱ doz 4.50
Victor ..... ₱ doz 13.50
Waverly ..... ₱ doz 4.00
White Mountain ..... ₱ doz 4.00
73 ..... ₱ doz 4.25
76 ..... ₱ doz 5.75
78 ..... ₱ doz. 6.50

Potato—
White Mountain ..... ₱ doz $4.50
Antrim Combination ..... ₱ doz $6.50
Roosier ..... ₱ doz $13.50
Saratoga ..... ₱ doz $6.50

Pencils—
Faber's Carpenters' ..... high list 50%
Faber's Round Gilt ..... ₱ gro $6.25
Dixon's Lead ..... ₱ gro $4.50
Dixon's Lumber ..... ₱ gro $6.75
Dixon's Carpenters' 10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Bow—
Humason, Beckley & Co.'s ..... 60&10%
Sargent & Co's. ..$17 and $18 ..... 60&10%
Peck, Stow & W Co... 50&10@50&10&5%

Curtain—
Silvered Glass ..... net
White Enamel ..... net

Escutcheon.
Iron, list Nov. 11, 1885 ..... 50&10@50&10&5%
Brass ..... 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 55%
1¼ and under, Galvanized 45%
1¼ and over, Plain 65%
1¼ and over, Galvanized 52½%
Boiler Tubes.
Sizes up to 2¼ in. inclusive 55%
8 ses 3 to 6 in. inclusive 65%
Sizes 7 in. and up 55%
Casing 50%

Planes and Plane Irons—
Wood Planes—
Molding ..... 35&2%
Bench, First Quality ..... 50&2%
Bench, Second Quality ..... 55&2%
Bailey's (Stanley R. & L. Co.). .. 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.) ..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10&20&10&10%
Victor Planes (Stanley R. & L. Co.). 20&10@20&10&10%
Steer's Iron Planes ..... 35@35&10%
Merrimac Mal. Iron Co.'s ..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co. ..... 50@50&10%
Gage Tool Co.'s Self-Setting ..... 20&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 20&10@20&10&10%
Standard Tool Co. ..... 50@50&5%

Plane Irons—
Butcher's ..... $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle" Ohio. Sandusky } ..... 35&2%
S. & I. J. White 35%

Plates.
Felloe ..... ₱ ₱ 6¢@6½¢

Pliers and Nippers—
Button's Patent ..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ..... 20&10@33⅓%
Humason & Beckley Mfg. Co. ..... 50@50&10%
Lindsay's Giant 40%
Gas Pliers 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters 20%
Morrill's Parallel, ₱ doz, $12.00 ..... 30&5%
Cronk's 8 in., $15.00; 10 in. $21.00. 40@40&5%

Plumbs and Levels—
Regular List ..... 70&10@70&10&10%
Disston's 50%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers ..... 10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₱ doz. No. 1, $6.00; No. 2, $9.00 ..... 25%
Silver & Co., 6-Ring., ₱ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L. ..... ₱ doz $6.00
Bishop's O. K. ..... ₱ doz $5.25
Bishop's Pioneer ..... ₱ doz $3.75
Bishop's American ..... ₱ doz $2.75
Eagle, Double Stale ..... ₱ doz $5.75
Eagle, Single Stale ..... ₱ doz $3.75
Buckeye, Single Stale ..... ₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00 ..... 25%
J. P. Lovell's Police Goods 25%

Polish, Metal.
Prestoline 30%
Prestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Polish, Stove.
Joseph Dixon's ..... ₱ gro $6.00, 10%
Gem ..... ₱ gro $4.50, 10%
Gold Medal ..... ₱ gro $6.00, 25%
Mirror ..... ₱ pro $6.00, —%
Lustro ..... ₱ gro $4.75
Ruby ..... ₱ gro $3.75
Rising Sun, 5 gro lots ..... ₱ gro $5.50
Dixon's Plumbago ..... ₱ ₱ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel. ₱ gro
Yates' Liquid, 2 3 5 10 gal. ... ₱ gal ..$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-₱ cans, ₱ ₱ 12½¢
Jet Black ..... ₱ gro $3.50
Japanese ..... ₱ gro $3.50
Fireside ..... ₱ gro $2.50
Diamond O. K. Enamel ..... ₱ gro $19.00
Bonnell's Liquid Stove Polish. ₱ gro $9.00
Bonnell's Paste Stove Polish.. ₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ₱ cans ..... 12½¢
Black Jack Water Paste, 5 and 10 ₱ cans ..... 12½¢
Nickel Plate Paste ..... ₱ gro $6.00
Crown Paste ..... ₱ gross, $7.20
Crown Paste, in 5 and 10 ₱ pails ₱ ₱ 12¢
Black Flag ..... ₱ gross, $7.20
Black Flag, 5 and 10 ₱ pails, ... ₱ ₱, 12¢
Black Flag, liquid, in bottles, ₱ gro. $8.00

Peppers, Corn—
Round or Square, 1 qt. ₱ gr $10.00@10.50
Round or Square, 1½ qt. ₱ gr $15@15.50
Round or Square, 2 qt. ₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned 40%
Enameled ..... 40&5%
Family, Howe's "Eureka" 40%
Family, L. F. C.'s "Handy" 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20&10&50%
Henis ..... ₱ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ₱ doz $3.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton ..... ₱ doz $18.00, 33⅓%
Curtiss Hammer ..... ₱ doz $9.00
Giant, No. 1 ..... ₱ doz, $15.00, 10%
Giant, No. 2 ..... ₱ doz, $15.00, 10%
Pelican ..... ₱ doz. $9.00, 25%
Eclipse ..... ₱ doz, $18.00, 30%

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 60%&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55@50%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "F" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating ... 60%
Shade Rack 45%
Tackle Blocks ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00 ..... 40%

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper Goods. 70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz. ..60@65¢
Bemis & Call Co.'s Cast Steel Drive. .50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality .... ₱ doz $2.50@3.00
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check .. 40%
Solid Tinners', P.S. & W. Co. ₱ doz $1.44, 55%
Tin'rs' Ho.'ow Punches P.S. & W. Co. 20&2%
Rice Hand: unches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₱ ₱ 35¢ 15%
Sliding Door, Bronzed Wr't Iron .. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door. Light. In. ½ ¾ 1
Per 100 feet $2.00 2.50 3.10, 10%
R. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.35...net

Terry's Steel Rail, ₱ foot ..... 4½¢
Victor Track Rail, 7¢ ₱ foot ..... 50&2%
Carrier Steel Rail, ₱ foot ..... 4½¢
Moore's Wrought Iron 25%

Rakes—
Cast Steel, Association goods ..60¢&@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable ..... 70&10&5%
Gibbs Lawn Rake ..... $12.00, 50&15
Canton Lawn Rake ..... $9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 60%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 35%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £. 10%
Jordan's AAAI, new list .. .. net
Jordan's Old Faithful, new list ..... net
Galvanic ..... ₱ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co. 55%
Sargent's ..... 60%&10@70&5%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co's .50&10@50&10&10%
Eilrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers ..... ₱ doz $2.00
Top of the Hill Rings ..... ₱ doz $1.25
Hill's Improved Ringers ..... ₱ doz $1.25
Hill's Old Style Ringers ..... ₱ doz $1.12½
Hill's Tongs ..... ₱ doz $3.00
Hill's Rings ..... ₱ doz bxs $1.00
Perfect Rings ..... ₱ doz bxs $1.50
Perfect Ringers ..... ₱ doz $2.15@2.30
Blair's Hog Ringers ..... ₱ doz $2.00
Blair's Hog Rings ..... ₱ doz 90¢@$1.00
Champion Ringers ..... ₱ doz $2.00
Champion Rings, Double ..... ₱ doz $2.25
Brown's Ringers ..... ₱ doz $2.00
Brown's Rings ..... ₱ doz $1.15@1.25
Electric Hog Rings ..... ₱ doz boxes $1.50
Electric Hog Ringers ..... ₱ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87 ..... 40%
Copper ..... 60@60&10%
Coppered Iron, Bo'tina Brand. 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass ..... 35&2%
Stair, Black Walnut .. .. ₱ doz 40¢

Rollers—
Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope.
Manila. ..½ in. and larger .... ₱ ₱ 10½¢
Manila ..... ½ in. ₱ ₱ 10½¢
Manila ..... ½ and 5-16 in. ₱ ₱ 11½¢
Manila Tarred Rope ..... ₱ ₱ 9¢
Manila, Hay Rope ..... ₱ ₱ 10½¢
Sisal ..... ½ inch and larger ₱ ₱ 7½¢
Sisal ..... ½ in. ₱ ₱ 7½¢
Sisal ..... ¼ and 5-16 in. ₱ ₱ 8½¢
Sisal, Hay Rope ..... ₱ ₱ 7½¢
Sisal, Tarred Rope ..... ₱ ₱ 6¾¢
Sisal, Medium Lathe Yarn ..... ₱ ₱ 6 ¢
New Zealand. ½ in. and larger ₱ ₱ 7 ¢
New Zealand ..... ½ inch, ₱ ₱ 7½¢
New Zealand, ¼ and 5-16 inch, ₱ ₱ 8 ¢
New Zealand, Hay Rope ..... ₱ ₱ 7 ¢
New Zealand, Tarred Rope ..... ₱ ₱ 6½¢
Note.—Manufacturers' prices on above ½¢ ₱ ₱ less, f. o. b. factory.
Cotton Rope ..... ₱ ₱ 13½@16¢
Jute Rope ..... ₱ ₱ 6½@6¾¢
Wire—
List May 1, 1886.
Iron ..... 32½&2½%
Iron, Galvanized ..... 40&2½%
Cast Steel ..... 40&2½%

Rules—
Boxwood ..... 80&10&10@80&10&10%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Diston's Cross Cuts 45%
Diston's Hand 20%
Woodrough & McParlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₱ foot ..... 20¢
Champion Thin Back Cross Cuts, ₱ foot ..... 28¢
Champion Extra Thin Back Cross Cuts, ₱ foot ..... 31¢
One Man Champion Cross Cuts, ₱ foot ..... 40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip 30%
Narrow Champion Cross Cuts with Handles, ₱ foot ..... 20¢
Champion Thin Back Cross Cuts, ₱ foot ..... 28¢
Champion Extra Thin Back Cross Cuts, ₱ foot ..... 31¢
One Man Champion Cross Cuts, ₱ ¢

Atkins' Circular Shingle and Heading ..... dis 50%
Atkins' Silver Steel Diamond X Cuts ..... ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ..... ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ..... ₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts ..... ₩ foot 20¢
Atkins' Hollow Back X Cuts ..₩ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ₩ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c 25%
C. E. Jennings & Co., Hand, Panel and Rip 25%

Hack Saws—
Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ..... 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—
Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cabinet Makers', $15 ..... 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Richie Bros.' Platform 40%

Scale Beams—See Beams, Scale.

Scissors, Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $4.50 ..... 30&10%
Box, 1 Handle ..... ₩ doz $4.00, 10%
Box, 2 Handle ..... ₩ doz $6.00, 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₩ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—
Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₩ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890.75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 75@75&10%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 60%&10%
Hand Rail, H. & T. Mfg. Co ..... 70&10@75%
Hand Rail, Am. Screw Co 75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W 35%
Jack Screws, Sargent ..... 60&10@60&10&5%
Jack Screws Stearns' ..... 40@40&10%

Cork—
Humason & Beckley Mfg. Co..40&10@50%
Williamson's ..... 33⅓@33⅓&25%
Howe Bros & Hulbert 35%

Machine—
Flat Head, Iron 55%
Round Head, Iron 50%

Wood—
List January 1, 1891.
Flat Head Iron ..... 72½% Extra 10 & 10&5 % of ten given.
Round Head Iron 67½%
Flat Head Brass 72½%
Round Head Brass ..... 65 %
Flat Head Bronze 72½%
Round Head Bronze ..... 65 %
Rogers' Drive Screws 85½%

Scroll Saws—See Saws, Scroll.

Scythes.

Grain ..... 40&5@40&10%
Grass ..... 40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.

Awl and Tool.
Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 ..... 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9. ..... 25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12, 2, $18 ..... 25%
Henry's Combination Haft...₩ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%

Nail—
Square ..... ₩ gr., $4 00@$4.25
Round ..... ₩ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point...₩ gr., $12, 20%

Rivet,
Regular list ..... 50&10%

Saw—
Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Imita ..... ₩ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₩ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's. No. 0, $9 00; No. 1, $15, 15@20% Sah's ..... 20&10@20&10&10

Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold ..... 40&10@50%
Atkin's Lever ..... ₩ doz No. 1, $6.00
Atkin's Criterion ..... ₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ..... ₩ doz $15, 50%

Sharpeners, Knife.

Parkins.
Applewood Handles...₩ doz $6.00, 40%
Rosewood or Cocobolo. ₩ doz $9.00, 40%

Shaves, Spoke.

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.)..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 35&10%
Goodell's, ₩ doz $9.00 ..... 25%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners' ..... 20&2%
Seymour's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers..50@50&10%
Second quality C. S. Trimmers, 50&10@50&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list.60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.
Disston's Combined Pruning Hook and Saw ..... ₩ doz $18.00, 20&10%
Disston's Pruning Hook, ₩ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools..... 40%
Pruning Shears, Henry's Pat, ₩ doz $3.75@4.00
Henry's Pruning Shears, ₩ doz $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co 60%

Tinners', &c.—
Shears and Snips (P. S. & W.)..... 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—

Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—
R. & E. list Dec. 18, 1885 ..... 60&10&2%
Sargent's list ..... 60&10%
Reading list ..... 50&10&10%

Ship Tools—

L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phoenix and Bryden's Boss, at factory 44.00
Bryden's Frog Pressure, at factory.35.00

Mule—
Add $1 ₩ keg to above prices.

Ox, Wrought—
Ton lots ..... ₩ ℔ 9¢
1000 ℔ lots ..... ₩ ℔ 9½¢
500 ℔ lots ..... ₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to BB, 25-℔ bag	$1.37	$1.42
Drop, up to BB, 5 ℔ bag	.35	.36
Drop, BB and larger, 25-℔ bag	1.62	1.67
Drop, BB and larger, 5-℔ bag	.40	.41
Buck and Chilled, 25-℔ bag	1.62	1.67
Buck and Chilled, 5-℔ bag	.40	.41
Dust Shot, 25-℔ bag	2.00	2.05
Dust Shot, 5-℔ bag	.45	.46

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods..... 20%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Binns & Co ..... 15@25%
Hubbard & Co ..... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
H. M. Myers Co ..... 30 %
Payne Pettebone & Son ..... 35½&5%
Remington's (Lowman's Pat.)50&10@40%
Rowland's, Black Iron ..... 50&10%
Rowland's Steel ..... 50&5@50&10%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co..... 50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₩ doz $3.00; ₩ gr $21.60
Electric ..... ₩ gr $21.60
J. & W. Sifters ..... ₩ doz 2.00
Hunter's ..... ₩ doz $2.00
Smith's Adjustable Sifters ...₩ doz $2.00
Smith's Adjustable Milk Strainer. ₩ doz $2.00
Smith's Adjustable T. & C. Strainer. ₩ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ doz..	80¢	$1.00
Mesh 20, Nested, ₩ doz..	95¢	1.10
Mesh 24, Nested, ₩ doz..	$1.15	1.25

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel...Special net prices
Coldbrookdale Iron Co 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—

School, by case ..... 50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) ..... 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded..... 70&10&10%
German, new list ..... 40&10%
Covert ..... 50&2%
Covert, New Patent ..... 50&5&2%
Covert, New R. E ..... 60&2%
Covered Spring ..... 60&10&10%

Snaths, Scythe.

List ..... 50@..%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—
Cuspidors, 8¼-inch, ₩ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list ..... 70&10%
Buffalo S. S. & Co... ..... 33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers..... 40&15%
C. Rogers & Bros ..... 40&15%
Rogers & Bro ..... 40&15%
Reed & Barton ..... 40@40&5%
Wm. Rogers Mfg. Co ..... 40, 15&5%
Simpson, Hall, Miller & Co..... 40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son..... .....50&12½%

Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver..... 50&10&5%
No. 30 Silver Metal..... 50&10&5%
No. 24 German Silver..... 50&10&5%
No. 50 Nickel Silver..... 50&5%
No. 49 Nickel Silver..... 60&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal ..... 50, 10&5%
18% Rogers' German Silver..... 60&5%
22% Rogers' Nickel Silver. ..... 50&5%
German Silver ..... 50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver ..... 50&5@50&10&5% cash
Britannia ..... 60@60&5%
Boardman's N'ck'l Silver..... 50&10&5%
Boardman's Britannia Spoons, case lots ..... 60&5% cash

Springs—

Door.—
Torrey's Rod, regular size....₩ doz $1.80
Gray's, ₩ gr., $20.00 ..... 20%
Bee Rod ₩ gr., $20.00 ..... 20%
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30 ..... 40&10@50%
Gem (Coil), list April 19, 1886 ..... 10%
Star (Coil), list April 19, 1886..... 20%
Victor (Coil) ..... 60@60&10%
Champion (Coil) ..... 60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₩ doz, $18.00; No. 2, $15.00 ..... 50%
Rubber, complete, ₩ doz, $4.50...55&10%
Hercules 50%
Shaw Door Check and Spring.25@30@35%

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Half Scroll ..... 60&10&10%
Cliff's Bolster Springs 20%

Squares—

Steel and Iron ..... } .80&10@80&10&10%
Nickel-Plated ..... }
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels..... 50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares..... 40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—
Blair's ..... ₩ doz $2.00
Blair's "Climax" ..... ₩ doz $1.25

Lemon—
Porcelain Lined, No. 1....₩ doz $6.00, 25&20%
Wood, No. 2 ..... ₩ doz $3.00, 35%
Wood, Common ..... ₩ doz $1.70@1.75
Dunlap's Improved ..... ₩ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz ..... 25&10%
Jennings' Star ..... ₩ doz $2.50
The Boss ..... ₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.25; 3, $1.90; Queen, $2.50
Little Giant ..... 50@50&5%
King ..... 40&5%
Hotchkiss Straight Flash..... ₩ doz $12.00
Silver & Co., Glass ..... ₩ gro. $9.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—
Barbed, ½ in. and larger.....₩ ℔ 7@7½¢
Barbed, ⅜ in ..... ₩ ℔ 8@8½¢
Fence Staples, Galvanized. } Same price as B'b'd Wire. See Trd. Rep.
Fence Staples, Plain..... }

Steelyards..... .....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods..... &10@50%
Butterfield's Goods..... 40&10@50%
Lightning Screw Plate..... 25@30%
Reece's New Screw Plates....33½&5@40%
Reversible Ratchet ..... 30 %
Gardner 25%

Stops, Bench.

Morrill's ..... ₩ doz $9, 50%
Hotchkiss's ..... ₩ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's ..... ₩ doz $8.. 10%
Cincinnati ..... 25&10%

Stone—

Hindostan No. 1, 8¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ..... ₩ ℔ 2½¢
Washita Stone, Extra ..... ₩ ℔ 20@21¢
Washita Stone, No. 1 ..... ₩ ℔ 15@16¢
Washita Stone, No. 2 ..... ₩ ℔ 11@12¢
Washita Slips, No. 1, Extra.. ₩ ℔ 37@40¢
Washita Slips, No. 1 ..... ₩ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in ..... ₩ ℔ 40¢
Turkey Slips ..... ₩ ℔ $1.00@1.50
Lake Superior, Chase ..... ₩ ℔ 12¢
Lake Superior Slips, Chase ..... ₩ ℔ 20¢
Seneca Stone, Red Paper Brand.... ₩ ℔ 15@20¢
Seneca Stone, High Rounds..₩ ℔ 20@22½¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished ..... ₩ doz $2.25
Cast Iron, Steel Points ..... ₩ doz 90¢
Socket ..... ₩ doz $1.75
Tullard's ..... 25@25&10%

Strops, Razor—

Genuine Emerson ..... 60@60&5%
Imitation " ....₩ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..... ₩ doz $2.00
Lamont Combination ..... ₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric ..... List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ doz $20, 50@50&5%
Perry .....₩ doz, No. 1, $15.00; No. 0, $21.00 ..... 50@50&10%
Draw Cut No. 4, each $80.00..... 20%
Enterprise Mfg. Co..... ..... 20&10@30%
Silver's ..... 40&10%

Sweepers, Carpet.

Bissell No. 5 ..... ₩ doz $17.00
Bissell No. 7 New Drop Pan..₩ doz $19.00
Bissell, Grand ..... ₩ doz $36.00
Grand Rapids ..... ₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ..... ₩ doz $15.00
Jewel ..... ₩ doz $17.00
Improved Parlor Queen, Nickeled ..... ₩ doz $27.00
Japanned ..... ₩ doz $24.00
Excelsior ..... ₩ doz $22.00
Garland ..... ₩ doz $18.00
Parlor Queen ..... ₩ doz $24.00
Housewife's Delight..... ₩ doz $15.00
Queen ..... ₩ doz $16.00
Queen, with band ..... ₩ doz $18.00
King ..... ₩ doz $30.00
Weed, Improved ..... ₩ doz $18.00
Hub ..... ₩ doz $16.00
Cog-Wheel ..... ₩ doz $16.00
Easy ..... ₩ doz $22.00
Monarch ..... ₩ doz $22.00
Goshen ..... ₩ doz $21.00
Ladies' Friend ..... ₩ doz $15.00
Advance ..... ₩ doz $18.00
Supreme ..... ₩ doz $32.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued 80%
Am. Iron, Tin'd or Cop'd..80&10%
Steel, Plain or Bright..... 75&10%
Steel, Tinned or Coppered..... 80%
Swedes Iron, Blued..... 75&10%
Swedes Iron, Tinned or Coy'd. .80%
American Iron Cut Tacks..... 80%
Swedes Ir. Uphol'rs' T'ks, Blu.75&10%
Swedes Iron Upholsterers' Tacks. Tinned 80%
Gimp and Lace Tacks, Blued..75&10%
Gimp and Lace Tacks, Tin'd..75&10%
Swedes Iron Basket or Trimmers' Tacks ..... 75&10%
Miners' Tacks 80%
Bill-Posters' or RR. Tacks.....75&10%
Bill-Posters' or Railroad Tacks, Tinned 80%
Copper Tacks 40%
Copper Finish. & Trunk Nails.... 40%
Cigar Box Nails 60%
Zinc Glaziers' Points 40%
Picture-Frame Points 60%
Looking-Glass Tacks 50%
Brush Tacks 55%
Tin-Capped Trunk Nails..... 55%
Finishing Nails ..... 70&10%
Trunk and Clout Nails, Black and Tinned 75%
Common and Patent Brads 75%
Hungarian Nails 75%
Basket and Chair Nails..... 70&10%
Leathered Carpet Tacks..... 55%

Miscellaneous—
Double-Pointed, 120 count..... 35&10%
Wire Carpet Nails ..... 50&10%
Plymouth Rock Steel Carpet Tacks..25%

Extra 5 @ 10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....60&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....35@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....30%

Lumber.

Ring Peavies, "Blue Line"...₱ dos $20.00
Ring Peavies, Common.....₱ dos $18.00
Steel Socket Peavies.....₱ dos $21.00
Mall. Iron Socket Peavies....₱ dos $19.00
Cant Hooks, "Blue Line"..₱ dos $16.00
Cant Hooks, Common Finish..₱ dos $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ dos $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ dos $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ dos $12.00
Hand Spikes....₱ dos 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ dos., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ dos, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ dos, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ dos, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ dos $18.00

Saw.

Atkins' Perfection.....₱ dos $12.00
Atkins' Excelsior.....₱ dos $6.00
Atkins' Giant.....₱ dos $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₱ dos holes, 11@12¢
Mouse, Round Wire.....₱ dos $1.50, 10%
Mouse, Cage, Wire.....₱ dos $2.50, 10%
Mouse, Catch-'em-alive....₱ ds $2.50 15%
Mouse, Bonanza.....₱ dos $0.90@$1.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ dos., 90¢; in full cases, ₱ dos.....75¢
Hotchkiss Imp. Rat Killer..₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer.....₱ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₱ dos $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ dos. 55&10%
Douglas'.....₱ dos $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Pease's Plastering.....25%
Clement & Maynard's.....30%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅓ ℔ Balls	26¢	34¢
No. 12, ¼ and ⅓ ℔ Balls	25¢	33¢
No. 18, ¼ and ⅓ ℔ Balls	22¢	32¢
No. 24, ¼ and ⅓ ℔ Balls	22¢	32¢
No. 36, ¼ and ⅓ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ⅓ ℔ Balls.52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅓ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1¼ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to dos..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....30@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20 @ 25 %

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%&10%
Hopkins'.....₱ dos $17.50, 10%
Reading.....40&10%
Wentworth.....30&10%

Miscellaneous.

Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....35&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70%
Boilers and Saucepans.40&10@50&5%
Tinned Boilers and S'pans.40&10@50&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10¼ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors.		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.	4.00	
Half-peck Measure.	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ dos., No. 2.....$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$3.00
See also *Pails*.

Silver Plated, Hollow—

4 mo. or 5 % cash in 30 days.

Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5%
} 40&5&5%

Washers—

Size hole	5-16	⅜	½	⅝ to 1⅜
Washers	6	5	3.50¢	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-2 boxes 1¢ to list.

Wedges—

Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 3¾¢

Weights, Sash—

Solid Eyes.....₱ ton $1@$9

Well Buckets, Galvanized- See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.36

Wire and Wire Goods—

Iron—

Market.
Br. & Ann., Nos. 0 to 18.....77½%
Cop'd, Nos. 0 to 18.....75%
Galv., Nos. 0 to 18.....67½%
Tin'd, Tinned list Nos. 0 to 18.....67½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....77½%
Bright and Ann'd, Nos. 19 to 26.....80%
Br. and Ann'd, Nos. 27 to 36.....82½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₱ ℔.... 5¢
Galvanized Fence, Nos. 8 and 9.....70%
Annealed Fence, Nos. 8 and 9.....80%
Annealed Grape, Nos 10 to 14.....80%
Brass, list Jan. 18, 1884.....35%
Copper, list Jan. 18, 1884.....35%
Barb Fence.....See Trade Report
Annealed Wire on Spools.....50%
Mallin'sSteel and Tin'd on Spools.....55%
Mallin's Brass and Cop. on Spools.....45%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....5%
Stubs' Steel Wire.....$6.00 to 2, 5%
Steel Music Wire, 12 to 30...60@70¢ ₱ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—

Standard list.....80&10%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&5%
Coes' "Mechanics'".....50&10&5%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Star dard...70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
} 75& 5 @ 75 &1 %
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ dos $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20@10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....35&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—

List September 20, 1890, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 35@35&10%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	52	@	60
Linseed, City, boiled.....	55	@	63
Linseed, Western, raw.....	..	@	50
Lard, City, Extra Winter..	..	@	56
Lard, City, Prime.....	..	@	52
Lard, City, Extra No. 1....	45	@	47½
Lard, City, No. 1.....	40	@	42½
Lard, Western, prime.....	51	@	..
Cotton-seed, Crude, prime.	31	@	32
Cotton-seed, Crude, off grades.....	25	@	30
Cotton-seed, Summer Yellow, prime.....	..	@	38
Cottonseed, Summer Yellow, off grades.....	32	@	36
Sperm, Crude.....	72	@	73
Sperm, Natural Spring.....	..	@	..
Sperm, Bleached Spring.....	..	@	..
Sperm, Natural Winter.....	73	@	75
Sperm, Bleached Winter...	78	@	80
Whale, Crude.....	..	@	..
Whale, Natural Winter.....	54	@	56
Whale, Bleached Winter...	56	@	58
Whale, Extra Bleached....	58	@	60
Sea Elephant, Bleached Winter.....	63	@	64
Menhaden, Crude, Sound...	25	@	..
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	27	@	..
Menhaden, Bleached W'ter.	29	@	..
Menhaden, Extra Bleached	31	@	33
Tallow, City, prime.....	42	@	..
Tallow, Western, prime....	..	@	..
Cocoanut, Ceylon.....	6¾	@	7¼
Cocoanut, Cochin.....	8¾	@	9
Cod, Domestic	40	@	42
Cod, Foreign.....	..	@	..
Red Elaine	36	@	38
Red Saponified..... ₱ ℔	4¾	@	5
Bank.....per gal	27	@	..
Straits.....	28	@	..
Olive, Italian, bbls.....	65	@	70
Neatsfoot, prime.....	55	@	65
Palm, prime, Lagos....₱ ℔	6	@	6½

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	7½	@	8
Black, 29 gravity, 15 cold test.....	8½	@	9
Black, 29 gravity, summer.	6½	@	7
Cylinder light, filtered.....	15	@	20
Cylinder, dark, filtered	12	@	15
Cylinder, dard, st'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	13½	@	14
Paraffine, 25 gravity.....	12½	@	13
Paraffine, 28 gravity.....	9½	@	10
Paraffine, red, 21 @ 22 gr'ty	..	@	..
Paraffine, red, 23½@33 gr'ty	13	@	14

Paints and Colors.

Barytes, Foreign, ₱ ton.	$22.00	@	$24.00
Barytes, Amer. floated...	30.00	@	32.00
Barytes, Amer. No. 1....	19.00	@	20.00
Barytes, Amer. No. 2....	13.00	@	16.00
Barytes, Amer., No. 3....	11.00	@	12.00
Blue, Celestial..... ₱ ℔	6	@	8
Blue, Chinese	50	@	55
Blue Prussian.....	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish	⅛	@	1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk..... ₱ ton.	2.75	@	3.00
Chalk, in bbls..₱ 100 ℔..	33	@	40
China Clay, English.... ₱ ton.	13.00	@	18.00
Cobalt Oxide, prep'd....	2.90	@	....
Cobalt Oxide, black.. .... lots 100 ℔.	2.60	@	....
Cobalt, Oxide, black..... less 100 ℔.	3.05	@	....
Green, Paris, in bulk.....	14	@	15½
Green Paris, 170 @ 175 ℔ kegs.....	14½	@	15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	8	@	11
Green, Chrome, pure....	22	@	25
Lead, Eng., B.B. white....	8¾	@	10
Lead, Amn. White, dry or in oil: Kegs, lots less than 1000 ℔..		@	7¼
Kegs, lots 1000 ℔ to 5 tons.		@	6¾
Kegs, lots 5 tons to 12 tons..		@	6½
Kegs, lots 12 tons and over..		@	6¼
Lead White in oil 25 ℔ tin pails add to kee price.		@	¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ½ bbls....	6¼	@	7
Lead, Red, kegs.....	6¾	@	7¾
Litharge, kegs.....	6½	@	7¼
Litharge, bbls. and ½ bbls....	6¼	@	7

TERMS, &c.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1¾
Ocher, French Washed....	1¼	@	2½
Ocher, German Washed....	1½	@	3
Ocher, American.....	½	@	1¾
Orange Mineral, English...	9	@	9½
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	9½	@	10
Orange Mineral, American.	8	@	8½
Paris White, English Cliff stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½	@	7
Red, Indian, American....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American. ₱ 100 ℔.	1.00	@	1.25
Red, Venetian, English....	1.00	@	1.50
Sienna, Italian, Burnt and Powd.₱ ℔	5	@	6½
Sienna, Ital., Burnt Lumps	1½	@	3½
Sienna, Ital., Raw, Powd..	5	@	6½
Sienna, Ital., Raw Lumps..	2	@	3½
Sienna, American, Raw....	1½	@	1¾
Sienna, American, Burnt and Powdered.....	1½	@	1¾
Talc, French.....	1¾	@	1¾
Talc, American.....	1	@	1¾
Terra Alba, Fr'ch. ₱ 100 ℔	90	@	1.00
Terra Alba, English	50	@	60
Terra Alba, American No.1	70	@	75
Terra Alba, American No.2	40	@	50
Umber, Turkey, Bat. and Powd.,..... ₱ ℔	3½	@	4
Umber, Turkey Bat.Ln	2¾	@	3
Umber, Turkey, Raw and Powdered.....	3½	@	..
Umber Turkey, R'w Lmps	2½	@	2¾
Umber, Turkey, Bnt. Amer.	1½	@	1¾
Umber, Turkey, R'w Amer.	1¾	@	1¾
Yellow, Chrome.....	10	@	25
Vermilion Americ. Lead..	11½	@	17
Vermilion, Quicks'er, bulk.	64	@	66
Vermilion, Quicks'er, bags.	65	@	67
Vermilion, Quicksilver, smaller pkgs.....	69	@	71
Vermilion English Import	80	@	85
Vermilion, fmitation, Eng.	8	@	25
Vermilion, Trieste.....	87½	@	90
Vermilion, Chinese.....	90	@	95
Whiting, Common. ₱ 100 ℔	40	@	45
Whiting, Gilders'.....	50	@	55
Zinc, American, dry.... ₱ ℔	4½	@	5
Zinc, French, Red Seal.....	..	@	8½
Zinc, French, Green Seal..	..	@	8½
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal....	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O.....	..	@	6½

Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over..... 10¼@ 11¼
lots less than 1 ton ..... 11 @ 11¼
Zinc, V. M. in Poppy Oil, Red Seal..... .. @ ..
lots of 1 ton and over.... 10 @ 10¼
Lots of less than 1 ton.... 10½@ 10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese..... ₱ ℔	35	@	40
Blue, Prussian.....	39	@	45
Blue, Ultramarine.....	13	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Putty.

In wooden pails.....	....	@	.01¼
In tin cans.....	.02	@	.02½
In bladders.....	.02	@	.02½

Spirits Turpentine.

In regular bbls.....	39½	@	..
In machine bbls.....	39½	@	..

Glue.

Low Grade.....₱ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	12	@	.

CURRENT METAL PRICES.

JUNE 17, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:		
⅜ to 2 in. round and square..	₩ lb	2.00 @ 2.10¢
1 to 6 in. x ½ to 1 in.....		
Refined Iron:		
⅜ to 2 in. round and square..	₩ lb	2.10 @ 2.30¢
1 to 4 in. x ⅜ to 1¾ in.....		
4½ to 6 in. x ⅜ to 1 in.....		
1 to 6 in. x ¼ and 5-16..	₩ lb	2.30 @ 2.50¢
Rods—⅜ and 11-16 round and sq..	₩ lb	2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb	2.40 @ 2.60¢
"Burden Best" Iron, base price..	₩ lb	3.00¢
Burden's "H. B. & S." Iron, base price	₩ lb	2.80¢
"Ulster"	₩ lb	3.00¢
Norway Bars		4.00¢
Norway Shapes		5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2½¢
Best Cast Steel, base price in small lots	3 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
16 to 16	₩ lb 3.00 @	3.00¢	3.35 @	¢
17 to 20	₩ lb 3.15 @	3.25¢	3.35 @	3.75 ¢
21 to 24	₩ lb 3.35 @	3.35¢	3.60 @	¢
25 and 26	₩ lb 3.35 @	....	3.60 @	¢
27	₩ lb 3.50 @	3.62½¢	3.85 @	¢
28	₩ lb 3.65 @	¢	4.10 @	¢
	B. B.			2d qual.
Galv'd, 14 to 20,	₩ lb. 4.75 @	...	4.60 @	¢
Galv'd, 21 to 24,	₩ lb, 5.12 @	...	5.00 @	¢
Galv'd, 25 to 26,	₩ lb, 5.50 @	...	5.35 @	¢
Galv'd, 27	₩ lb, 5 90 @	...	5.70 @	¢
Galv'd, 28	₩ lb, 6.25 @	...	6.10 @	¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 10½¢ @		11¢	
American Cold Rolled B. B.	₩ lb 5¢ @		7¢	
Craig Polished Sheet Steel	₩ lb, 8½¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs	23¢
Straits, Pigs	22¢
Straits in Bars	24¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade	IC, 10 x 14..	.... @	$6.50
" "	IC, 12 x 12..	.... @	6.75
" "	IC, 14 x 20..	.... @	6.50
" "	IC, 20 x 28..	.... @	13 20
" "	IX, 10 x 14..	.... @	8.00
" "	IX, 12 x 12..	.... @	8 25
" "	IX, 14 x 20..	.... @	8 00
" "	IX, 20 x 28..	.... @	16 00
" "	DC, 12¾ x 17..	.... @	6.00
" "	DX, 12¾ x 17..	.... @	7.00
Calland Grade	IC, 10 x 14..	.... @	6.50
" "	IC, 12 x 12..	.... @	6 75
" "	IC, 14 x 20..	.... @	6.40
" "	IX, 10 x 14..	.... @	7.65
" "	IX, 12 x 12..	.... @	8.00
" "	IX 14 x 20.	.... @	7.65
Allaway Grade	IC, 10 x 14..	.... @	6.15
" "	IC, 12 x 12..	.... @	6.30
" "	IC, 14 x 20..	.... @	6.15
" "	IC, 20 x 28..	.... @	12.00
" "	IX, 10 x 14..	.... @	7.30
" "	IX, 12 x 12..	.... @	7.60
	IX, 14 x 20..	.... @	7.30
	IX, 20 x 28..	.... @	14.00
" "	DC, 12¾ x 17..	.... @	5.80
" "	DX, 12¾ x 17.. 6.00	@	6.80

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	.... @	$5.70
10 x 20..	.... @	7.85
20 x 28..	.... @	11.20
IX, 10 x 14, 14 x 20..	.... @	6.60
BV Grade.—IC, 10 x 14, 14 x 20..	.... @	5.70

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	.... @	$5.45
20 x 28..	.... @	10.60
IX, 14 x 20..	.... @	6.20
20 x 28..	.... @	12.35
Abecarne Grade.—IC, 14 x 20..	.... @	5.25
20 x 28..	.... @	10.60
IX, 14 x 20..	.... @	6.35
20 x 28..	.... @	12.35

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.....	.... @	$13.50
IXX, 14 x 28.....112 sheets....	.... @	13.75
IXX, 14 x 31.... ....112 sheets	.... @	15.25

Copper.

DUTY: Pig, Bar and Ingot, 1½¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot.

Lake...	@	15 ¢
Anson'a Grade Arizona	@	13¼¢
Ansonia Grade Casting	@	12¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.27	0.29	0.31	0.35

Bolt Copper, ⅜ inch diameter and over, per pound..... 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 18 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48, 14 x 52, 14 x 56, 14 x 60 in.

14 and 16 oz. and heavier..33¢. By the case...32¢ ₩ lb
12 oz. and lighter.....35¢. By the case...34¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..36¢. 12 oz.....39¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	37	33	30	29	28	27	24
15	13	38	34	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	42¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ ..%

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 10	in. 10 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.22½	.23¾	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 26	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.75

Brass and Copper Wire.

Old English guage standard.	Com. high brass. Per lb.	Low brass. Per lb.	Gildf'g br'ze & copper Per lb
All Nos. to No. 16, inclusive	$0.22	$0 26	$0.30
No. 17 and No. 18	.23	.27	.31
No. 19 " " 20	.24	.28	.32
No. 21	.25	.29	.33
No. 22	.26	.30	.34
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.52
No. 31	.51	.55	.57
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

	Per lb.		Per lb.
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No. 15	70¢
No 10	54¢		

Tobin Bronze—Rods.

¼ inch and larger..... 18¢ ₩ lb, net

Tobin Bronze—Piston Rods.

1¼ inch and smaller..... 19¢ ₩ lb, net
Over 1¼ inch..... 21¢ ₩ lb, net

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5¼¢ @ 6 ¢
Bertha (pure)	8½¢ @ 9 ¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	6¾¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American	4½¢ @ 5¢
Bar	5 ¢ @ 5½¢
Pipe, subject to trade discount	7¢
Tin-Lined Pipe, subject to trade discount	10¢
Block Tin Pipes, subject to trade discount	37½¢
Sheet, subject to trade discount	7½¢

Solder.

½ @ ½ (Guaranteed)	14¢
No. 1	12¢
Extra Wiping	11¾¢ @ 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 16¢ @ 16½¢
Hallett's	" @ 16 ¢

ALUMINUM.

Prices in Ingots.

In lots of 2000 lb and over..... ₩ lb $1.50

Old Metals.

(Prices Paid in New York.

Heavy Copper	₩ lb 12 ¢
Light Copper	₩ lb 11 ¢
Heavy Brass	₩ lb 10 ¢
Light Brass	₩ lb 8 ¢
Lead	₩ lb 4 ¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 3 ¢
No. 1 Pewter	₩ lb 16 ¢
No. 2 Pewter	₩ lb 8 ¢
Wrought Scrap Iron	₩ gross ton $19.00
Heavy Cast Scrap	₩ gross ton 12.00
Stove Plate Scrap	₩ gross ton 8.00
Burnt Iron	₩ gross ton 6.00

FIG. 1.

GENERAL VIEW OF THE BROWN HOISTING AND CONVEYING MACHINE AT THE STEEL WORKS OF JONES & LAUGHLINS (LTD.)